

# **SERVICE MANUAL**

7.62-mm Degtyarev  
Light Machine Gun (RPD)

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**7.62-MM DEGTYAREV LIGHT MACHINE GUN (RPD)**

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## Table of Contents

	<u>Page</u>
I. <u>Combat Characteristics of the IMG</u> .....	1
Tactical-technical data .....	1
II. <u>Construction of the IMG</u> .....	5
1. Barrel .....	5
2. Casing .....	13
3. Bolt mechanism .....	16
4. Trigger frame with butt and grip .....	20
5. Trigger mechanism .....	22
6. Belt feed with cover .....	23
7. Sighting mechanism .....	24
8. Hand guard .....	29
9. Bipod .....	29
10. Drum with belt .....	31
11. Spare parts and accessories .....	31
III. <u>Disassembling and Assembling of the IMG</u> .....	36
12. Partial Disassembling and Assembling .....	36
13. Complete Disassembling and Assembling .....	42
14. Disassembling and Assembling in the Ordnance <u>Machine-shop</u> .....	50
IV. <u>Interaction of the Parts During Firing</u> .....	58
V. <u>Technical Inspection of the IMG</u> .....	62
15. Daily Inspection of the IMG .....	62
16. Inspection of the IMG in the Assembled State .....	63
17. Inspection of the IMG in the Disassembled State .....	65
VI. <u>Preparation of the IMG for Firing</u> .....	71
18. Filling the Belt with Cartridges and Inserting it in the Drum .....	71
19. Adjustment of the Regulator .....	76
VII. <u>Handling of the IMG in the Firing Position</u> .....	78
20. Emplacement of the IMG .....	78
21. Adjustment of the Sighting Mechanism .....	78
22. Loading of the IMG .....	79

	<u>Page</u>
23. Sighting with the LMG and Firing .....	83
24. Unloading of the LMG .....	84
25. Measures to Prevent and Eliminate Stoppages .....	84
VIII. <u>Examination of the Accuracy of Fire and the Testing of the</u> <u>LMG</u> .....	88
26. The LMG Must Be Tested .....	88
27. Testing of the LMG During Single-shot Fire .....	91
28. Testing of the LMG During Automatic Fire .....	97
IX. <u>Cleaning and Lubrication of the LMG</u> .....	99
29. The LMG Must Be Cleaned and Lubricated .....	99
30. Materials To Be Used for Cleaning and Oiling .....	99
31. Sequence During Cleaning and Oiling .....	100
X. <u>Storage of the LMG</u> .....	104
XI. <u>Ammunition</u> .....	106
32. General .....	106
33. Live Cartridges .....	106
34. Identification Characteristics of the Bullets .....	110
35. Mode of Operation of the Special Bullets .....	110
36. Practice Cartridges .....	111
37. Packing of the Cartridges .....	111
38. Safekeeping and Storing of the Ammunition .....	111

## I. COMBAT CHARACTERISTICS OF THE LMG

The LMG is the most important automatic weapon of the LMG team. It is used for the destruction of exposed living group targets and of important individual targets up to a distance of 800 m and for combat against air targets to a height of 500 m.

The LMG is capable of bursts of fire of short and long duration:

- Theoretic rate of fire 650 rounds per minute;
- practical rate of fire at short bursts of fire 150 rounds per minute;
- up to 300 rounds can be fired without barrel cooling;
- sight range 1,000 m (sight is adjustable for each 50 m);
- cartridge, short cartridge 43, 7.62 mm.

### Tactical-technical data

Weight of the MG with drum, belt and accessories	7.4 kg
Weight of the MG with drum, filled belt and accessories	9.0 kg
Weight of drum	0.5 kg
Weight of the belt	0.3 kg
Initial velocity ( $V_0$ ) of an individual projectile	735 m/sec
Capacity of a belt	100 cartridges
Length of the MG	1037 mm
Length of the sight line	595.5 mm
Length of the cartridge	56 mm
Weight of an individual projectile	7.9 g
Weight of the cartridge with single projectile	16.2 g

The LMG can be fired from various positions and in movement. During marches, the LMG is carried with the strap. The bipod is aligned with the barrel and fastened with a spring pressure piece.



Figure 1.(a) Assembly view of the LMG (from the right)





Figure 1.(b) Assembly view of the LMG (from the left)

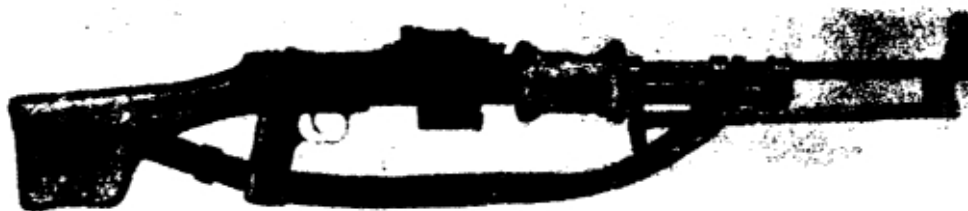


Figure 2. Total view of the LMG (in marching position)

## II. CONSTRUCTION OF THE LMG

The LMG is a gas pressure loader with hinged cover support. The cartridges are fed by means of a metal belt of 100 cartridges each. The belt is contained in the drum that is fastened to the MG under the feed belt. The trigger mechanism is arranged for the firing of bursts (sustained firing) and is provided with a safety mechanism. To improve manipulation and as a protection against burns, a hand guard has been attached to the MG. The barrel is not separated from the chamber.

### Parts of the LMG

The LMG consists of

- Barrel 1,
- casing 2,
- bolt mechanism 3,
- trigger frame with butt and grip 4,
- trigger mechanism 5,
- belt feed with cover 6,
- sighting mechanism 7,
- hand guard 8,
- bipod 9,
- drum with belt 10,
- container with accessories, 11.

#### 1. Barrel

In the barrel (figure 4), the projectile receives direction, rotation and velocity. It is connected with the chamber by a thread and fastened by means of a pin (cannot be disassembled !).

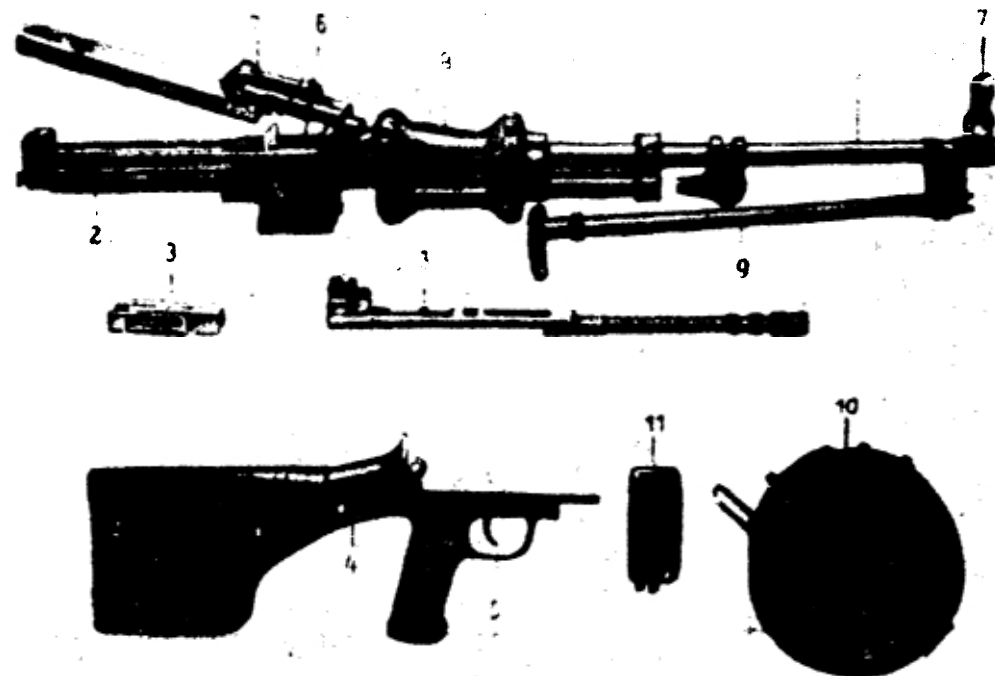


Figure 3. 1 - Barrel; 2 - Casing; 3 - Bolt mechanism; 4 - Trigger frame with butt and grip; 5 - Trigger installation; 6 - Belt feed with cover; 7 - Sighting mechanism; 8 - Hand guard; 9 - Bipod; 10 - Drum with belt; 11 - Container with accessories.

On the barrel is front sight holder 1, in whose transverse slot front sight protection 2 is fastened with the bolt of front sight base 3, and connecting piece 4 and gas cylinder 5. On the outside of the barrel is ring-nut 6 for attaching the bipod. At the breech piece is thread 7, on which the muzzle protection is to be screwed for the cleaning of the barrel, and a nozzle for firing with blank cartridges. For the firing with live ammunition, the muzzle nut is screwed on. At the barrel nozzle is recess 8 for the extractor. The barrel is divided into the cartridge chamber and the rifled part.

The cartridge chamber is reinforced by a flange and receives the cartridge. The transition portion makes it possible that the bullet carves itself evenly into the rifling. In the rifled portion of the barrel are four grooves which run from left to right and give the bullet the spin around its longitudinal axis. The interstices between the grooves are called lands. The caliber is measured from one land to the opposite land and amounts to 7.62 mm.

In the center portion of the barrel at the lower part is gas conduit 12, which diverts a portion of the powder gases to the gas chamber.

The front sight holder (figure 5) is mounted on the breech piece and attached with two pins. On top it has two transverse slots 2, into which the front sight protector is placed. The front sight holder has a threaded hole for the insertion of a holding screw. On the lower part, the front sight holder has a recess which limits the rotary motion of the bipod, and at the front wall scale 5 with graduations in mm (10 graduations) for the shifting of the front sight while sighting in.

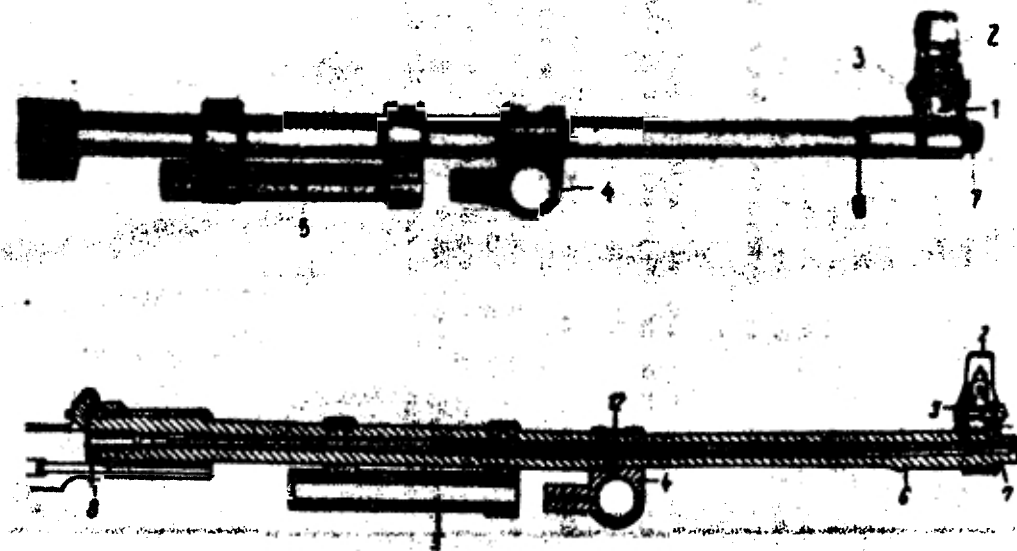


Figure 4. Barrel

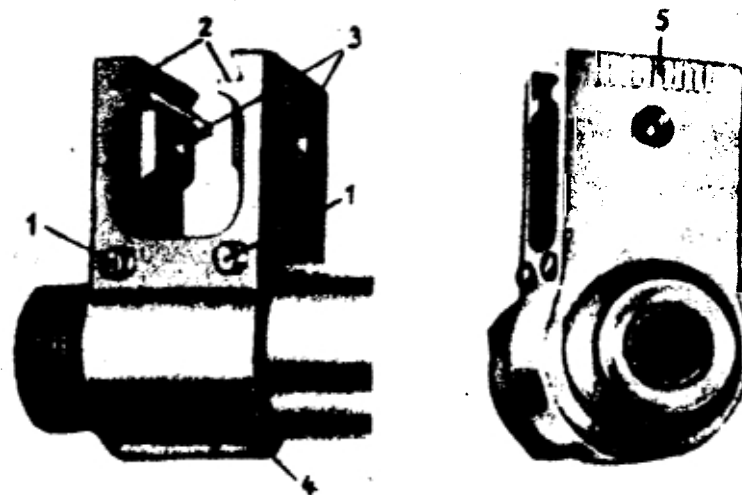


Figure 5. Front-sight holder

The connection piece (figures 6 and 7) contains the regulator and is attached to the barrel with two pins. The connection piece has three borings. The vertical boring 2 is the gas conduit, transverse opening 3 receives the regulator, longitudinal boring 4 in gas conduit 5 conducts the gases to the piston. At the right side of the connection piece is regulator stop 6 for the adjustment of the regulator. Regulator 7 is inserted in the transverse boring and secured with screw 8.

The regulator (figure 8) regulates the powder gases which are diverted from the barrel to the gas chamber. On the outside it has three control notches 1 with varying widths (2.6, 2.9 and 3.2 mm), which are marked with the numbers "1," "2" and "3" at the rim of the regulator. Through the recesses of the regulator, the powder gases flow from the gas conduit into the gas chamber to the gas piston. The rim of the regulator has three semi-round recesses 3 for the regulator stop opposite the numerals "1," "2" and "3." On the inside, the regulator has thread 5 for the insertion of the screw and recesses 4 for the key.

The regulator is attached in the connection piece with the regulator screw (figure 9). It has threaded portion 1, head 2 with circular track 3 and, at the front, semi-round recess 4 for the key and spring plate 5.



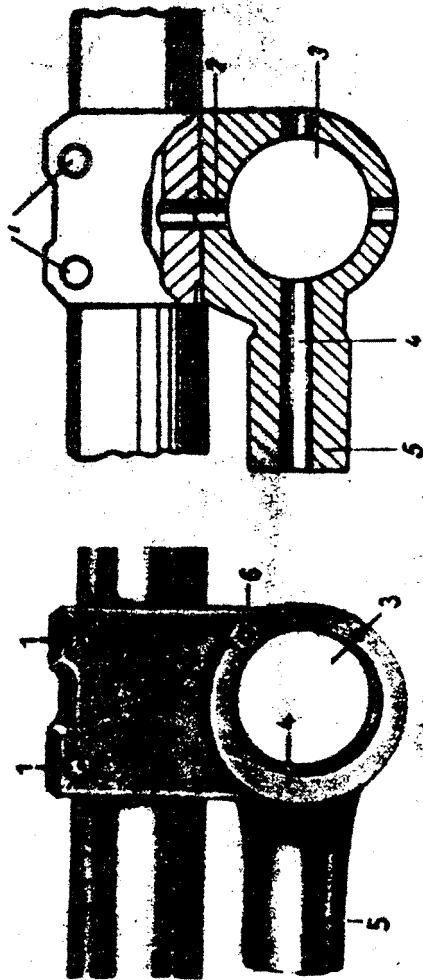


Figure 6. Connecting piece

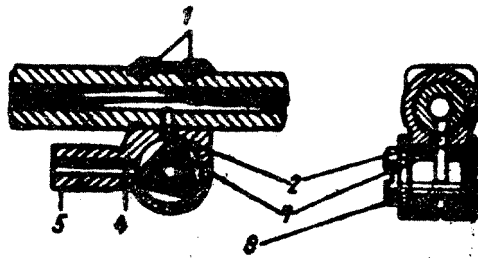


Figure 7. Connecting piece with regulator

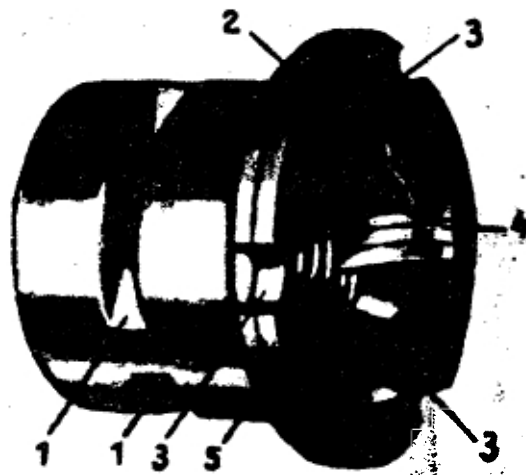


Figure 8. Regulator

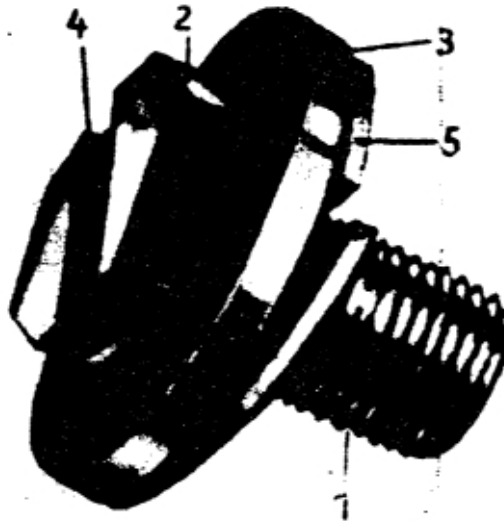


Figure 9. Regulator screw

The gas cylinder (figure 4) guides the gas conduit. It is connected to the barrel with two muffs and attached with pins. The rear muff forms one piece with the gas cylinder, the frontal muff is an individual part.

The muzzle nut is screwed onto the barrel and protects the thread from damage.

## 2. The Casing

The casing (figure 10) connects all parts of the MG and contains the breech mechanism. The casing has in the front a boring with thread for the insertion of the barrel and a boring for the locking pin.

The hand guard lugs are inserted into recesses 1. Drum holder 2, which supports the drum, is fastened on the left side.

On the upper part of the casing is lug 3, in which the belt feed and cover are fastened.

The lower part of the belt feed is inserted into notch 4. The elongated recess is breech recess 5.

The ejector is inserted into front bridge 6. Rear bridge 7 has recess 8 for the cover plate lock. The lock of the connecting bolt is inserted into the right wall of the bridge.

At the right side is guide groove 9 for the cocking slide. The rear end of the guide groove is widened so that when the weapon is disassembled or assembled, the cocking slide can be removed more easily.

The casing has recesses on the inside, which accomodate the support mountings during the locking of the barrel. The longitudinal grooves lessen the friction of the lock at the casing wall and take up the cam grooves at the lock guide.

The ejector fastened in the casing ejects the cartridges. It is inserted with its dovetailed base in the bridge and has a lug against which the cartridges strike during the return movement of the breech.

The drum holder holds the drum to the casing. It has guide lugs for the guide rails of the drum and a drum lock.

On the upper side, the lock is covered by a plate.

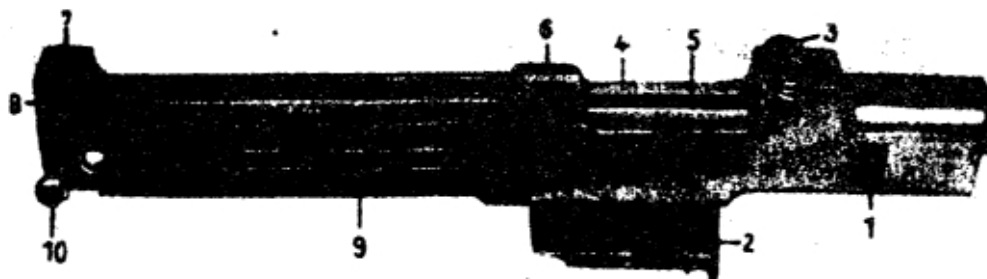


Figure 10. Casing

### 3. The Breech Mechanism

The breech mechanism closes the barrel from the rear and causes the introduction and ignition of the cartridge as well as the extraction and ejection of the cartridge cases after the firing.

The breech mechanism consists of the bolt assembly and the bolt guide and the gas conduit.

The bolt assembly (figure 11) consists of chamber 1, two support flaps 2, firing pin 3, extractor 4 with claw and spring.

The chamber (figure 12) has in the front notch 1 for the bottom of the cartridge case, borehole 2 for the firing pin, recess 3 for the extractor with spring, lug 4 to set it up on the bolt guide, expeller 5 with nut 6 for the ejector; at the sides it has recess 7 for the support flaps, borehole 8 for the locking pin of the extractor; borehole 9 for the locking pin of the firing pin.

The bolt assembly is locked by the support flaps. The support flaps have lugs on the inside. These lugs hit the inclined planes of the anvil at the bolt guide and press support flaps apart. The beveling at the bolt guide closes the support flaps during the release, and the bolt assembly is unlocked.

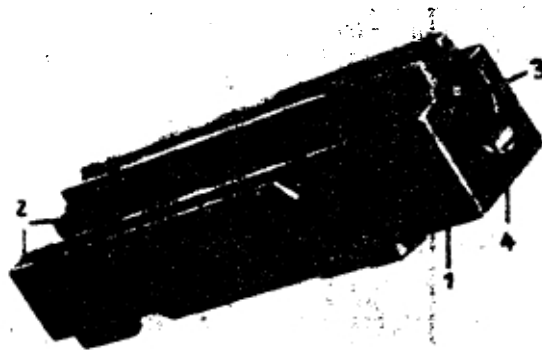


Figure 11. Bolt Mechanism

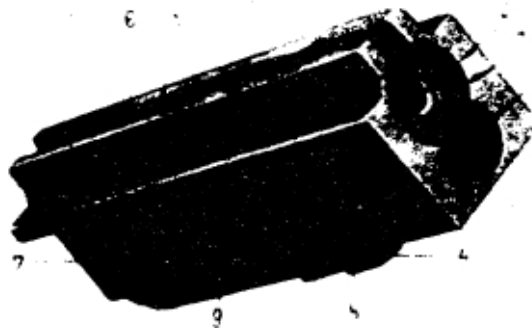


Figure 12. Chamber

The firing pin (figure 13) strikes the percussion cap of the cartridge. It is divided into firing pin tip 1 and firing pin shaft 2. The firing pin shaft has longitudinal ribs 3, which increase the strength and lessen the friction surface. It also includes the beveled surface of the firing-pin locking pin.

The extractor draws the cartridge from the cartridge chamber and holds on to it until it meets the ejector. The extractor is spring-mounted in the chamber.

The bolt guide (figure 14) contains the bolt assembly and operates the feed mechanism.

On the upper side it has a notch for the insertion of the support flap lugs, an opening 2 for the cartridge exit, anvil 3 and roll 4. On the lower part is a recess that serves as a trigger guard. On the sides are guide rails 5, which glide in the guide grooves of the casing. The bolt guide has a thread in the front for the insertion of gas conduit 6.



Figure 13. Firing pin



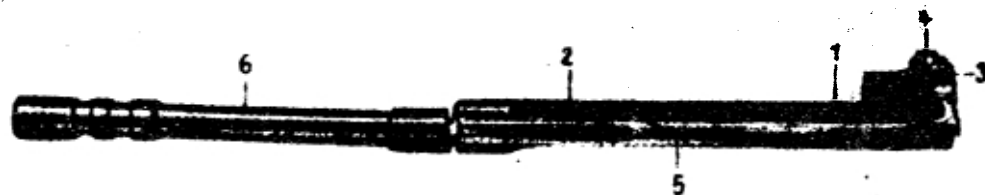


Figure 14. Bolt - guide

The bevelings at the notches cause the closing of the support flaps during the unlocking of the barrel. The anvil presses the support flaps apart by means of the beveling, strikes the firing pin with the front face and sets the feed mechanism in motion with the roll. The anvil has a vertical boring, into which the axis of the roll is set.

The gas conduit sets the bolt guide in motion as soon as it is hit by the powder gases. It has a plate-like recess at the front end that catches the powder gases. The rear end has a thread for the attachment of the gas conduit to the bolt guide.

#### 4. Trigger Frame with Butt and Grip

The trigger frame with butt (figure 15) contains the trigger installation, limits the return motion of the bolt guide and makes a better handling of the weapon possible.

Trigger frame 1 has longitudinal rails 2 at its upper part for connection with the casing. The trigger installation fits into opening 3. At its lower part, the trigger frame has two fully-pierced cross borings for safety mechanism 4 and the axis of trigger 5, plus trigger guard 6 for the protection of the trigger. The stocks are fastened to the grip by screw 7.

At its rear end, the trigger frame ends as a block that limits the return movement of the bolt guide. The block has two posts 9 with borings for the connecting bolt; one boring for the pressing rod of the locking spring, and an opening 10 for the attachment of the butt. This opening has on its lower part a longitudinal notch and on the sides borings for screw 11 for the attachment of the butt to the trigger frame. At the left side of the trigger frame is the storage space for the cleaning rod.

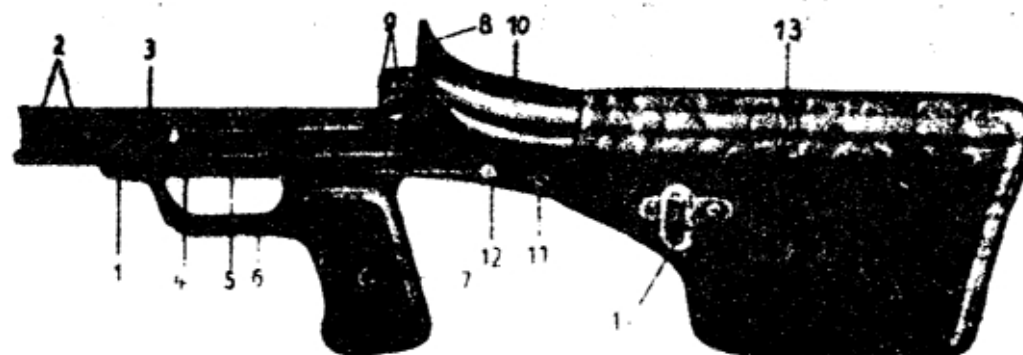


Figure 15. Trigger frame with butt and grip

The cocking slide is used to tighten the bolt assembly. It has a cocking slide strip with cocking lug and a folding cocking grip. The cocking slide has guide ledges that slide in the right casing wall.

The locking spring brings the gliding parts to the most advanced position. It consists of the spring and the pressing rod.

The pressing rod is connected with the locking spring and sits with its front end in the boring of the bolt guide.

Butt 13 is set with its front end in the opening of the trigger frame and is attached by screw 11. On the inside, the butt has a boring into which the plug for the insertion of the locking spring fits, and a recess for the insertion of the container with the accessories. At the left side is belt hook 14.

#### 5. The Trigger Installation

The trigger installation (figure 16) is mounted in the trigger frame. It includes trigger sear 1 with spring 2, trigger 3 with locking pin 4 and safety mechanism 5 with spring 6.

The trigger sear keeps the bolt guide in the most rearward position. It has an opening for the trigger, a lug for the connection with the trigger frame, and a place for the spring.

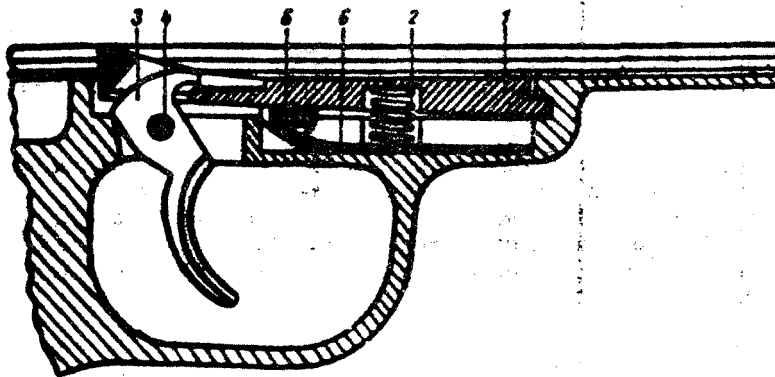


Figure 16. Trigger mechanism

At the trigger are the lug, which engages the recess in the trigger sear, and the boring for the locking pin.

The safety mechanism puts the MG at "safe." The safety mechanism has a shaft and a wing. In the shaft is a recess to support the safety spring. The safety mechanism is held by the spring both in the safe and activated positions. The spring has a lug which engages the recess in the trigger frame.

#### 6. Feed Mechanism with Cover

The feed mechanism (figure 17) is actuated by the transport lever together with the bolt guide. It feeds the cartridges contained in the metal belt in such a manner that they can be ejected by the expeller from the belt.

The feed mechanism includes upper part 1 of feed mechanism, lower part 2 of the feed mechanism and casing cover 3.

The upper part of the feed mechanism is mounted on the cover. In the upper part of the feed mechanism, the belt feed pawl is inserted into the guide groove with a shock-mounted belt feed lever, and the shock-mounted pressure lever is attached there. The lugs connect the

upper part of the feed mechanism to the casing. The cover closes the upper part of the casing. A transport lever and a belt feed lever are mounted in the cover. The roller of the belt guide glides in the curve-shaped guide rail of the transport lever. The belt feed lever is connected with the transport lever and causes during the forward and return stroke of the bolt assembly the lateral movement of the belt-feed.

The lower part of the feed mechanism is inserted in the casing recess and is connected with the casing by means of a lug. The lower part of the feed mechanism contains a shock-mounted belt-holding pawl, a cartridge entry and two dust-protection shutters. A hollow shaft with a cotter-pin connects the feed belt lever with the upper part of the feed mechanism and the cover.

#### 7. Sighting Mechanism

Sighting and distance adjustment are accomplished by means of the sighting mechanism. It consists of the rear sight and the muzzle sight. The sighting mechanism (figure 18) includes rear sight base 1, rear sight leaf with spring 2, sight slide 3 with thumb nut 4 and springs, rear sight cam 5 and adjustable screw 6.

The rear sight base is attached to the cover. It has curve-formed cleats for the adjustment of the rear sight leaf in accordance with the range, lugs with borings and openings for the lugs of the rear sight leaf, as well as a recess for the leaf-type spring.

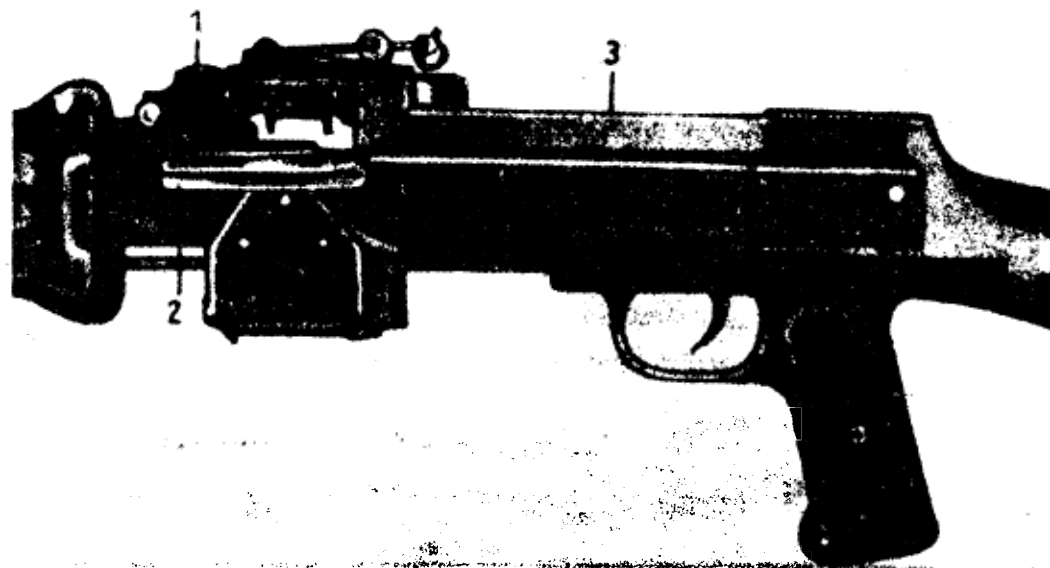


Figure 17. Belt-feed with cover

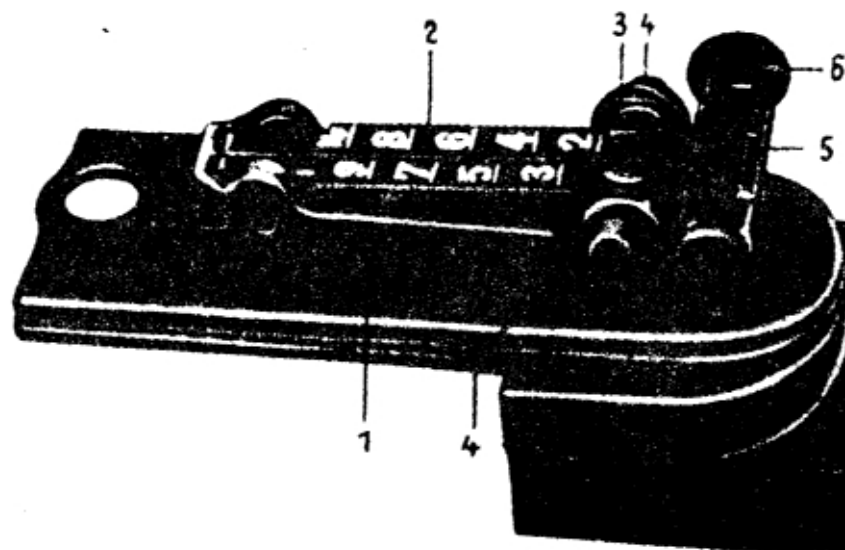


Figure 18. Sighting mechanism



The rear sight leaf has lugs for the connection with the rear sight base and notches for the sight slide. On the rear sight leaf is a scale with graduations from 1 to 10 (100 to 1,000m).

The rear sight leaf has a lug in the rear whose cylindrical cross drill boring is for the attachment of the rear sight cam and the adjustable screw. On the upper side the lug has a cross-milled recess for the rear sight cam and in the rear a scale with seven graduations to both sides. The center mark is designated "0." One graduation of the scale amounts to 1.2 mm; this corresponds to 2/1000 of the range.

The leaf-type spring bears on the lower end of the rear sight leaf and presses it against the slide rest.

By means of the sight slide the sight is adjusted to the corresponding range. The sight slide has two thumb nuts with springs, which keep it on the rear sight leaf.

The rear sight cam lies in the boring of the rear sight leaf lug and can be laterally moved with the aid of the adjustable screw. By a lateral movement of the rear sight cam, lateral correction can be carried out.

The movement of the sight notch by one graduation to the right or left of the center mark of the scale corresponds to an aberration of 2/1000 of the range (i.e. at a distance of 100 m it amounts to 20 cm, at a distance of 200 m to 40 cm, etc.).

The muzzle sight (figure 19) has at its lower end thread 1 to screw in the muzzle sight protection. In the diameter it has a longitudinal notch 2, to prevent a loosening of the muzzle sight of its own accord. The muzzle sight has flat attachments 3 on the top for the muzzle sight key and tapers to pin 4, which is used to sight in the target.

The muzzle sight protector (picture 20) holds the muzzle sight, protects it against damage and aids sighting in bright light. The muzzle sight protector has dovetailed extension 1 for connection with the muzzle sight holder; on top it has protective flanges 2, and in the center threaded boring 3 extending all the way through for the insertion of the muzzle sight.

At the front surface is adjustable notch 4, which during sighting is synchronized with a graduation of the muzzle sight base.

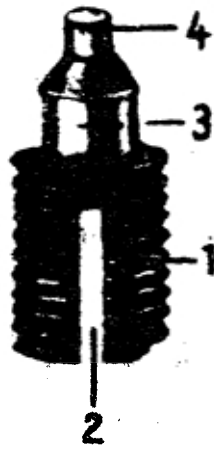


Figure 19. Front sight

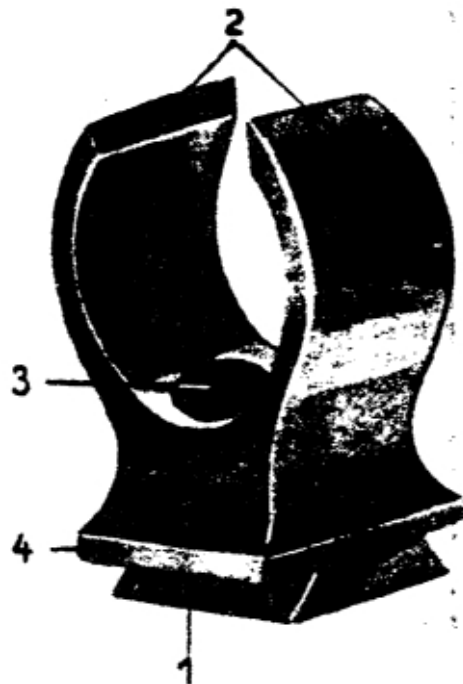


Figure 20. Front sight protector

#### 8. The Hand Guard

The hand guard (figure 21) protects against burns and facilitates the handling of the MG. It consists of two wooden shells 1, which are connected by four screws. The left shell has boring 2 for the cleaning rod.

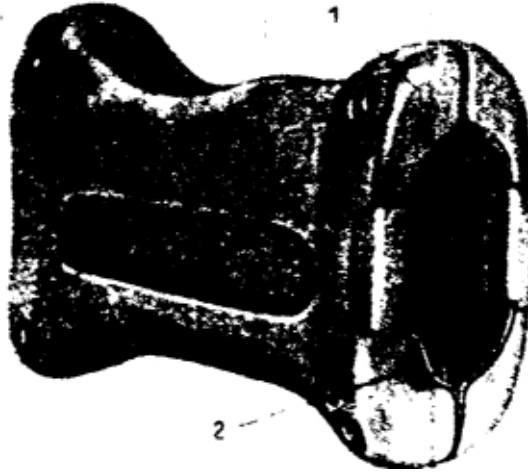


Figure 21. Hand guard

#### 9. The Bipod

The bipod (figure 22) is the front support of the MG during firing. It consists of clamping foot 1, clamp 2, connection pin 3, two legs 4, spring 5 and spring lock 6.

The bipod is attached to the barrel by a clamp. The recesses at the clamp foot keep the legs of the bipod in a ready or rest position.

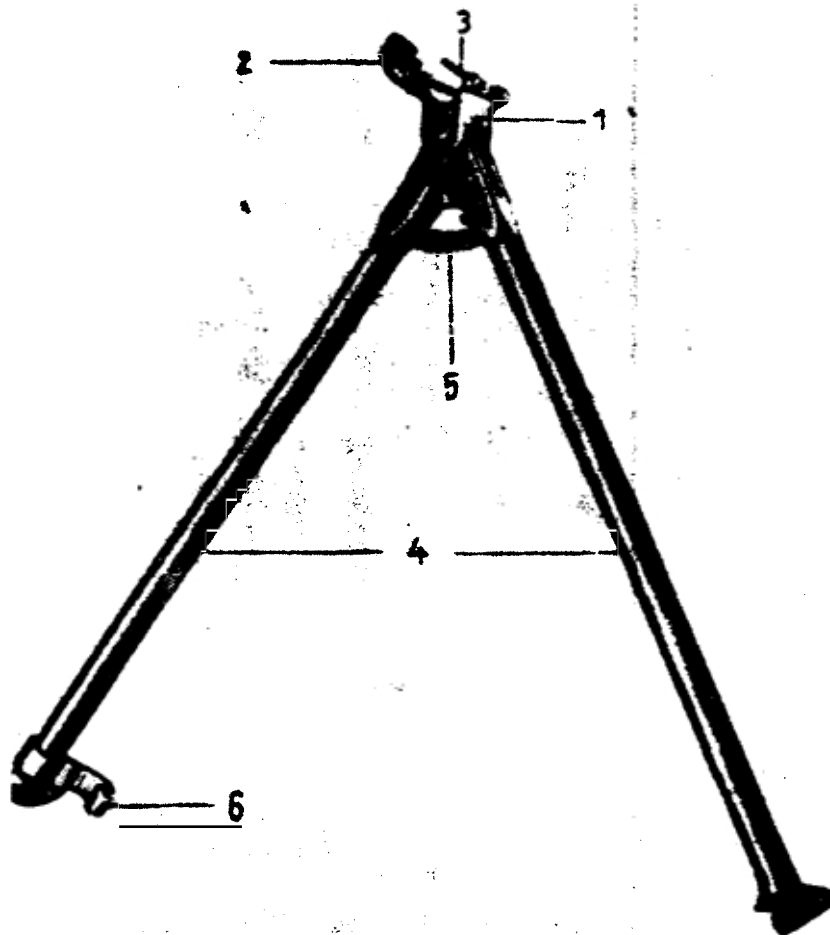


Figure 22. Bipod

#### 10. Drum with Belt

The drum is attached to the drum holder and holds the cartridge belt.

The drum (figure 23) has casing 1 and cover 2. The drum cover is attached to the casing by hinge joint 3 and is kept closed by latch 4. The casing and the cover have ring-shaped ribs to increase their stability. The drum casing has guide rail 5 at the top, by which the drum is attached to the drum holder. At the drum casing is an opening with cover, from which the cartridge belt is conducted to the feed mechanism, and grip 6 for carrying.

#### 11. Spare Parts and Accessories

Every MG is equipped with spare parts and accessories.

The spare parts are greased, wrapped in oil paper and stored in the units.

The accessories (figure 26) include:

The cleaning rod, the container for the accessories in which are contained the regulator key, muzzle sight key 2, toggle 3 and reamer 4 for cleaning the gas routes, cartridge extractor 5, revolving cleaning attachment 6 and punch 7. Also included in the accessories is a carrying strap, a covering for the MG and bags for the drums.

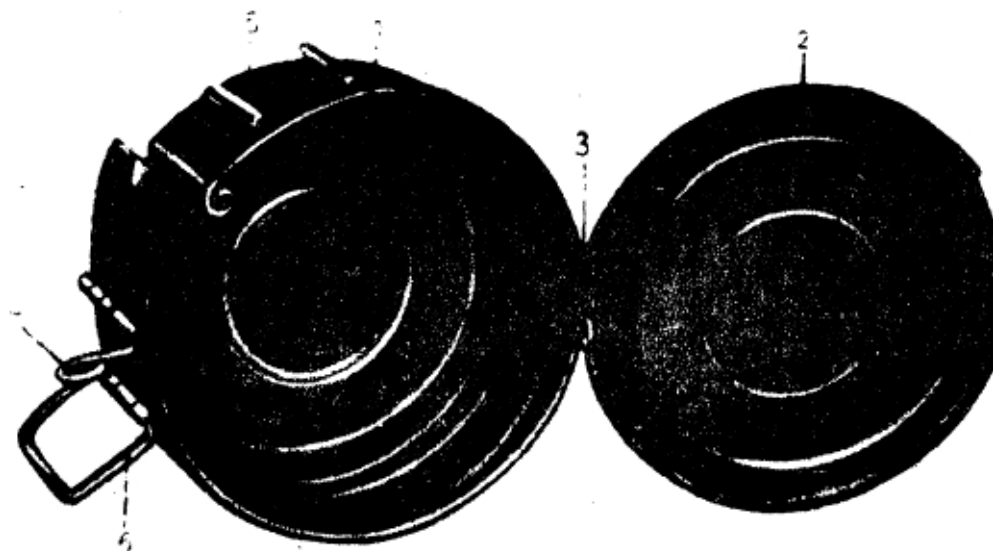


Figure 23. Drum

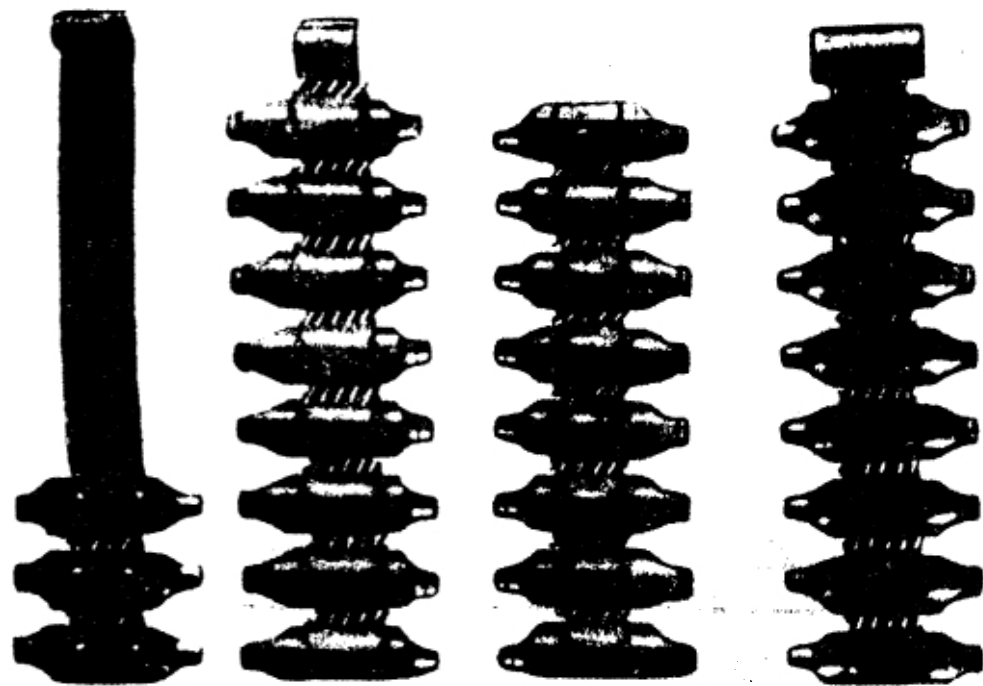


Figure 24. Cartridge belt

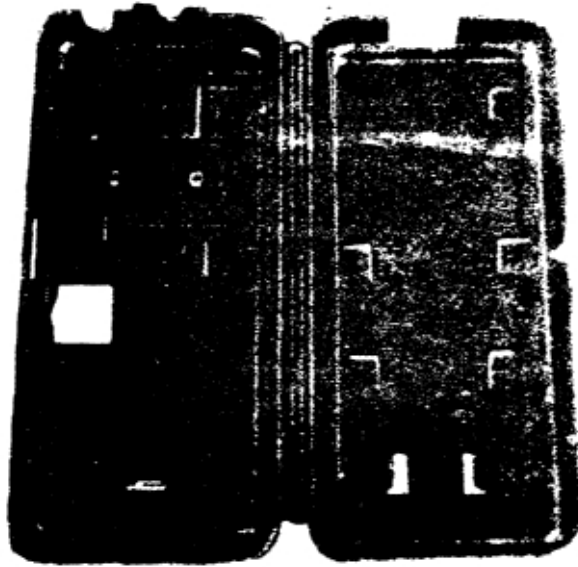


Figure 25. Container for the accessories



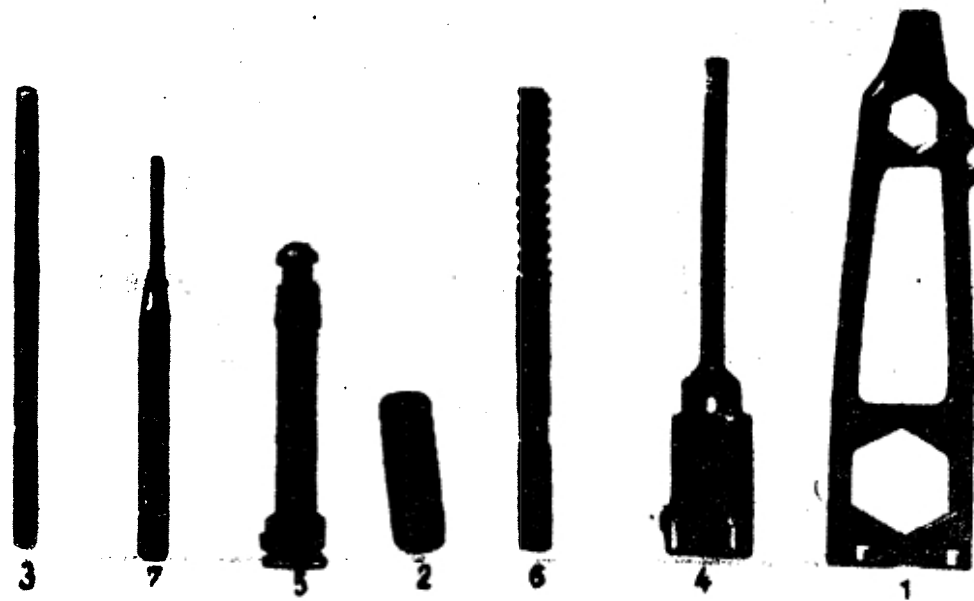


Figure 26. Accessories

### III. DISASSEMBLING AND ASSEMBLING THE LMG

The LMG must be disassembled for cleaning, for inspection, for oiling, for the exchange of parts and for repair work.

In doing so, the following is to be observed:

- The MG must be disassembled and assembled on a table, or, if in the open country, on a clean foundation;
- only satisfactory accessories are to be used for disassembling and assembling;
- the parts must be detached and attached without using much force;
- screws must be loosened first with the screw driver and then removed by hand;
- in assembling, attention must be placed on the numbers of the parts to avoid a mix-up with parts of other MG's;
- the MG must be disassembled, cleaned, oiled and assembled only under supervision of the group leader;
- before disassembling, the MG must be unloaded;
- a difference must be made between partial and complete assembling and disassembling.

#### 12. Partial Disassembling and Assembling

Before disassembling, the MG must be placed on the bipod. The MG is disassembled in the following manner:

##### 1. Detach the cleaning rod:

Grasp the cleaning rod with the left hand, move it off to that extent that the head of the cleaning rod emerges from the recess in the trigger frame. Grasp the cleaning rod at the head and draw it from its storage place to the rear.

##### 2. Remove Container with accessories:

Press with the right thumb on the block of the butt plate, turn the cover with the left hand to the left or right (a quarter revolution), lift the MG at the barrel and remove the accessories container from the recess of the butt.

##### 3. Open the casing cover:

Grasp the neck of the butt with the left hand, move the cover block with the right hand forward to the stop and lift the cover to the extent that the spring block lug of the belt feed reaches behind the casing lug (in an opened position, the cover must be held by the spring block).

4. Remove the breech-closing spring from the butt:

Support the MG with the left hand at the neck of the butt, press the right thumb or the screw driver on the head of the breech-closing spring block and turn it a quarter revolution to the left. Then remove the breech-closing spring.

5. Remove the trigger frame from the casing:

Push out the connection pin with the punch to the right unto the stop. Grasp the hand guard with the left hand and the neck of the butt with the right hand and remove the trigger frame toward the rear.

6. Detach the cocking slide:

Grasp the hand guard with the left hand, withdraw the cocking slide with the right hand to the enlargement of the cutout of the guide rail in the casing and remove toward the right.

7. Remove the breech mechanism:

Withdraw the bolt guide with the right index finger from below still farther, grasp it with the right hand and pull it out of the casing to the rear.

8. Detach the bolt assembly from the bolt guide:

Hold the bolt guide in the left hand, lift with the right hand the bolt assembly from the bolt guide and remove the support flaps from the bolt assembly.

This concludes the partial disassembly of the MG. It is re-assembled in reverse order.

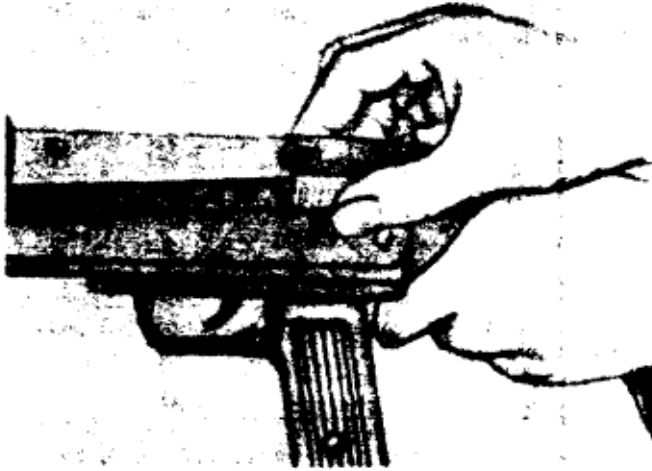


Figure 27. Opening the casing cover



Figure 28. Taking the main spring out of the butt

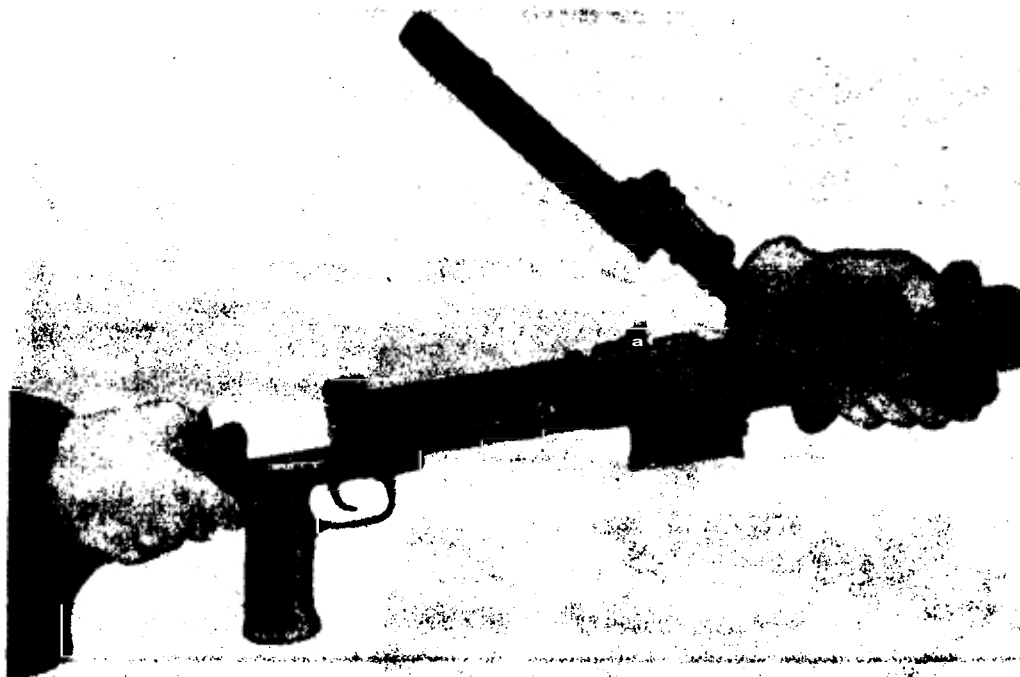


Figure 29. Removing the trigger frame from the casing

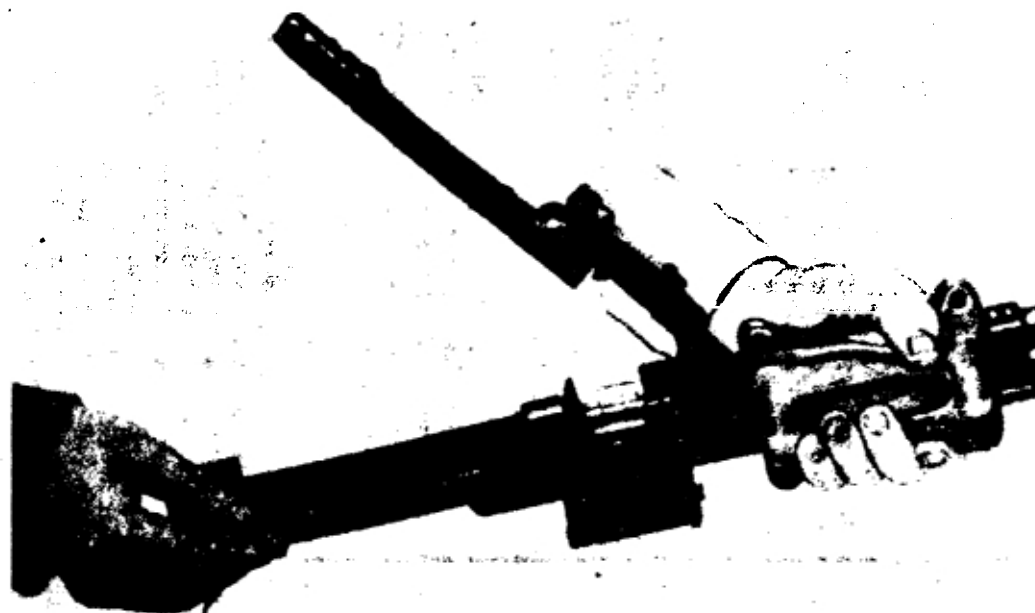


Figure 30. Taking the cocking slide out

### 13. Complete Disassembling and Assembling

The complete disassembling of the MG is the continuation of the partial disassembling and isto be carried out in the following order:

#### 9. Disassemble the bolt assembly:

- a) Remove the extractor from the bolt assembly:  
Place the breech mechanism in such a manner on wooden blocks that the locking pin gets to lie between the blocks; knock out the locking pin with punch and hammer; take the bolt assembly into the left hand, press with the thumb the extractor against the recess and draw out the punch from the boring for the locking pin; remove the extractor, the block and the spring of the extractor from the bolt assembly.
- b) Remove the firing pin:  
  
Place the bolt assembly in such a manner on the wooden blocks that the locking pin gets to lie between the blocks; knock out the locking pin with punch and hammer; remove the firing pin from the boring of the bolt assembly.

#### 10. Take off the Regulator:

Unscrew the regulator screw about two or three revolutions with the key, move the regulator to the right and hit with the mallet the head of the regulator screw; hold the regulator at the circular track, unscrew the screw completely by hand and remove the regulator.

#### 11. Disassemble the Belt Feed

Press in the spring bolt of the hollow axis below the upper part of the belt feed with the regulator key, close the casing cover and extract the bolt upward with the regulator key; open the casing cover, hold the hollow axis from below with the left hand, force the punch into it and detach it, seize with the left hand the casing behind the drum holder, grasp with the right hand the open casing cover and draw it off from the upper part of the belt feed toward the rear; shove the belt feed pawl toward the left out of the guide grooves of the upper part of the belt feed, press the ring lug of the transport lever out of the boring in the cover with the thumb or a screw driver, take the cover into the left hand and press the retaining spring with the thumb toward the cover; seize with the right hand the transport lever and remove it from the axis.



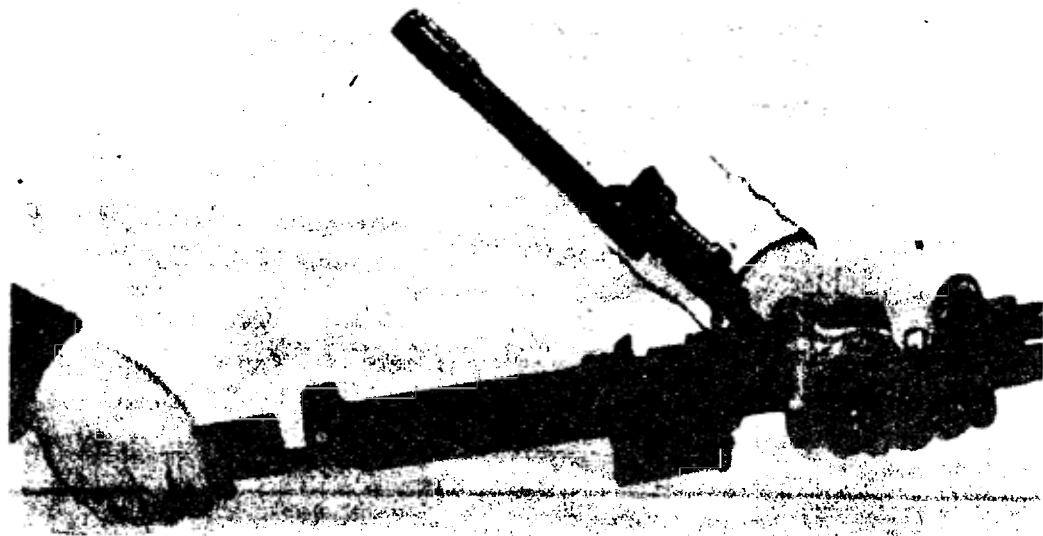


Figure 31. Removing the bolt mechanism



Figure 32. Detaching the bolt mechanism from the bolt guide

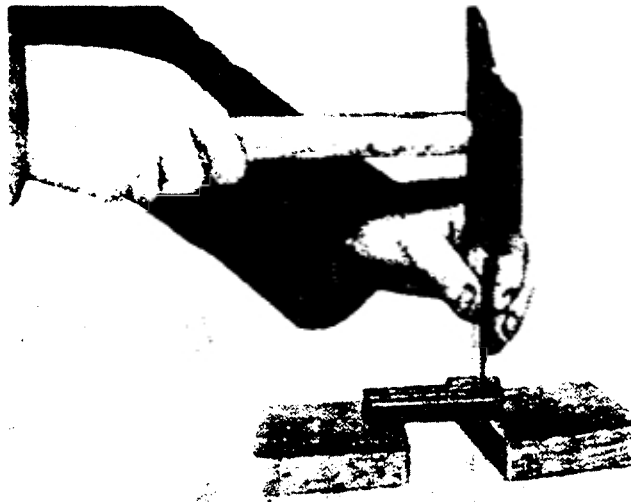


Figure 33. Taking out the locking pin of the extractor



Figure 34. Removing the extractor



Figure 35. Detaching the regulator

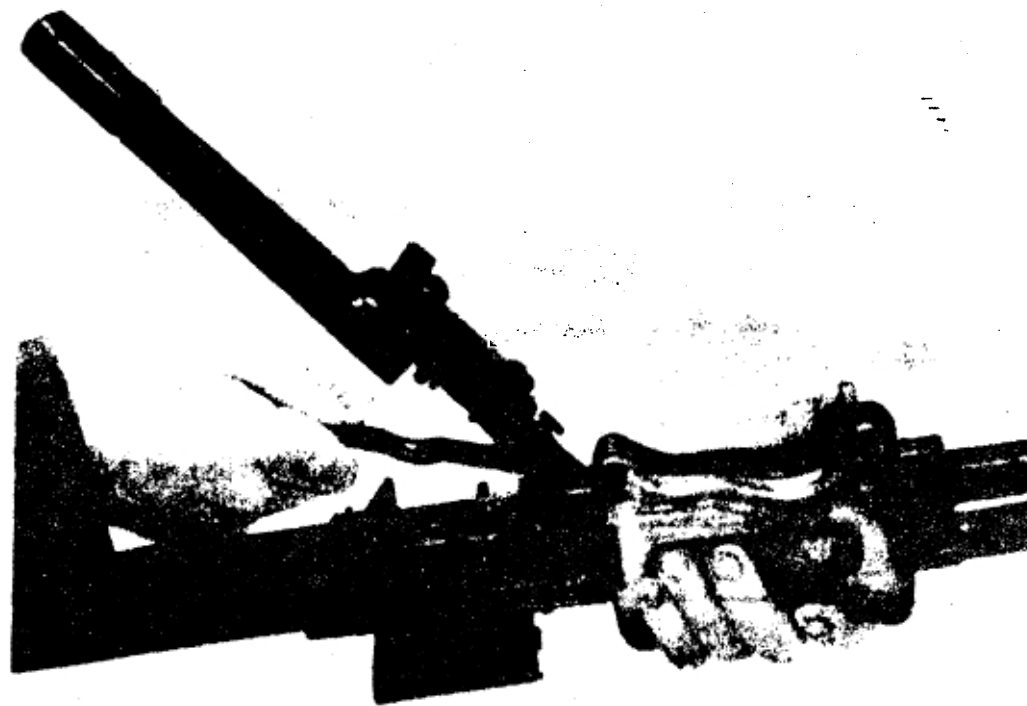


Figure 36. Pressing the spring bolt in with the regulator key

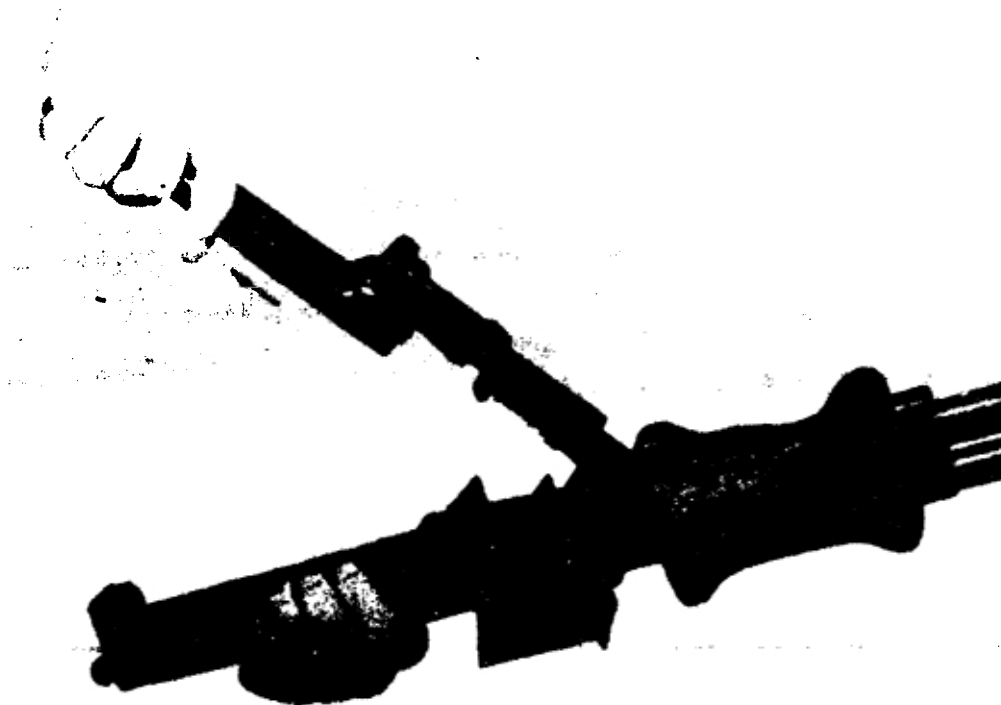


Figure 37. Removing the casing cover from the upper part of the belt feed

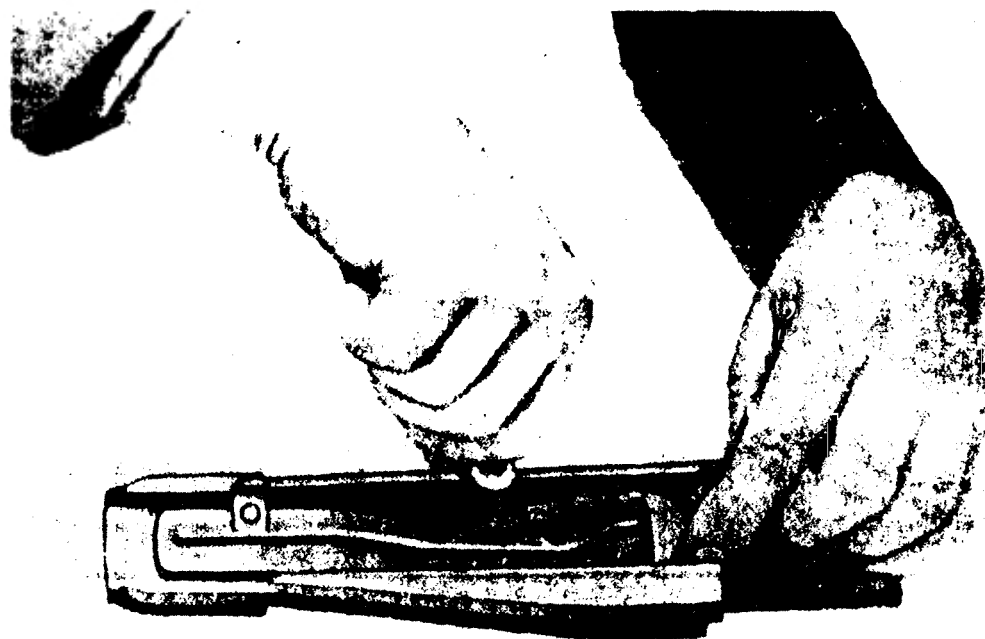


Figure 38. Taking the transport and belt-feed pawl levers out of the casing cover

Move both levers to the right and take them out of the cover; separate the belt-feed pawl lever and the transport lever; knock out the belt feed locking bolt with punch and hammer toward the right and extract the upper and lower parts of the belt feed from the casing in an upward direction.

12. Unscrew the Hand Guard:

Loosen the four connecting screws with the screw driver of the regulator key and remove both parts of the hand guard.

This terminates the complete disassembling. The assembling takes place in reverse order.

Note: Any further disassembling of parts is permitted only in the ordnance machine-shop.

14. Disassembling and Assembling in the Ordnance Machine-shop.

1. Disassemble the trigger installation:

Shift the safety wing forward, i.e. put the MG at "safe;" place the trigger frame on two wooden blocks in such a manner that the locking pin of the trigger is lying between the blocks; knock out the locking pin with punch and hammer and take out the sear and the sear spring; take the punch into the right hand and press with the thin end of the punch on the rear end of the retaining spring, grasp the retaining spring with the left thumb and index finger and take the safety device out of the boring of the trigger frame.

2. Assemble the trigger installation:

Take the retaining spring into the right hand and place it through the round recess into the groove of the trigger frame; place the end of the punch into the boring of the retaining spring and push the spring into the most advanced position; press the end of the retaining spring with the thin end of the punch into the groove bottom in the trigger frame; shift the safety wing to the rear, and place the retaining spring into the round recess of the block in the trigger frame, place the trigger spring with the right index finger in the block of the trigger frame and press on the trigger lever (in doing so, the latter must descend slightly); shift the safety wing forward; hold the sear with the left hand, insert from below the trigger with the right hand and connect its cam with the lug of the recess at the sear; take the trigger frame



in the left hand, hold the sear with the thumb and the trigger with the index finger so that the borings are facing each other; insert with the right hand the locking pin of the trigger; drive it in with a copper hammer and center punch it; shift the safety wing to the rear.

3. Disassembling and assembling the sighting mechanism:

Push the sight slide to the rear; hold the rear end of the rear sight leaf with the left hand, press the front end of the sight leaf onto the rear sight base with the screw driver in the right hand, push the rear sight leaf back with the left hand and take it off from the rear sight base; lift the front end of the retaining spring in such a manner that the retaining lug of the spring emerges from the recess of the rear sight base; press down the thumb nuts, push the sight slide to the front end and remove it from the rear sight leaf; release the thumb nuts and remove them with the spring from the borings of the sight slide; place the sight leaf on a wooden block in such a manner that the pin of the adjustable screw is at the side; knock the latter out with punch and hammer; unscrew the roller from the adjustable screw; remove the adjustable screw with the rear sight cam from the lug boring of the rear sight leaf. The assembling of the sighting mechanism takes place in reverse order.

4. Remove the muzzle sight protector and the muzzle sight:

Loosen the nut of the muzzle sight retaining screw with the regulator key by two to three revolutions and then unscrew the screw by hand; knock out the muzzle sight protector from the grooves of the muzzle sight holder.

The insertion of the muzzle sight and of the muzzle sight holder is carried out in reverse order.

5. Remove the bipod:

Knock out the retaining pin of the clamp on one side with punch and hammer and open up the clamp. After the mounting of the muzzle sight, the firing accuracy of the MG must be re-examined.

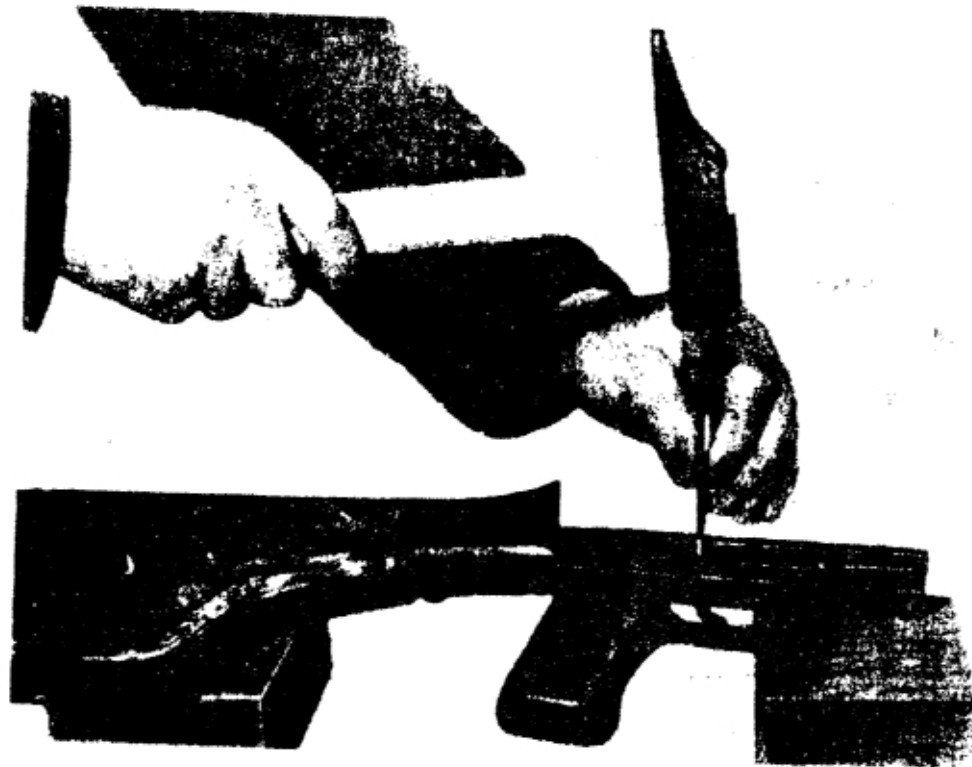


Figure 39. Removing the locking pin of the trigger

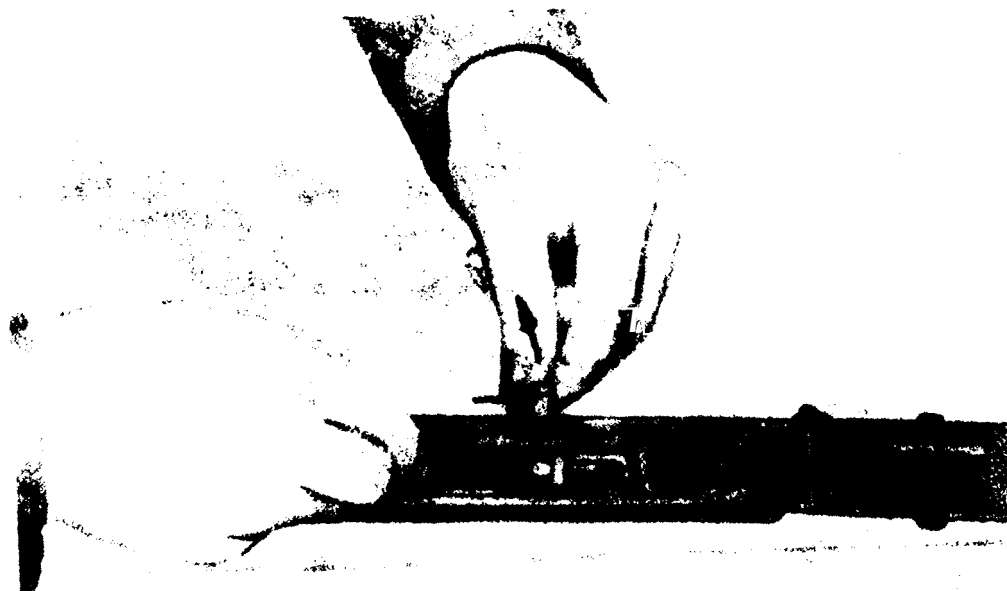


Figure 40. Removing the safety device



Figure 41. Inserting the retaining spring



Figure 42. Inserting the sear



Figure 43. Detaching the rear-sight leaf

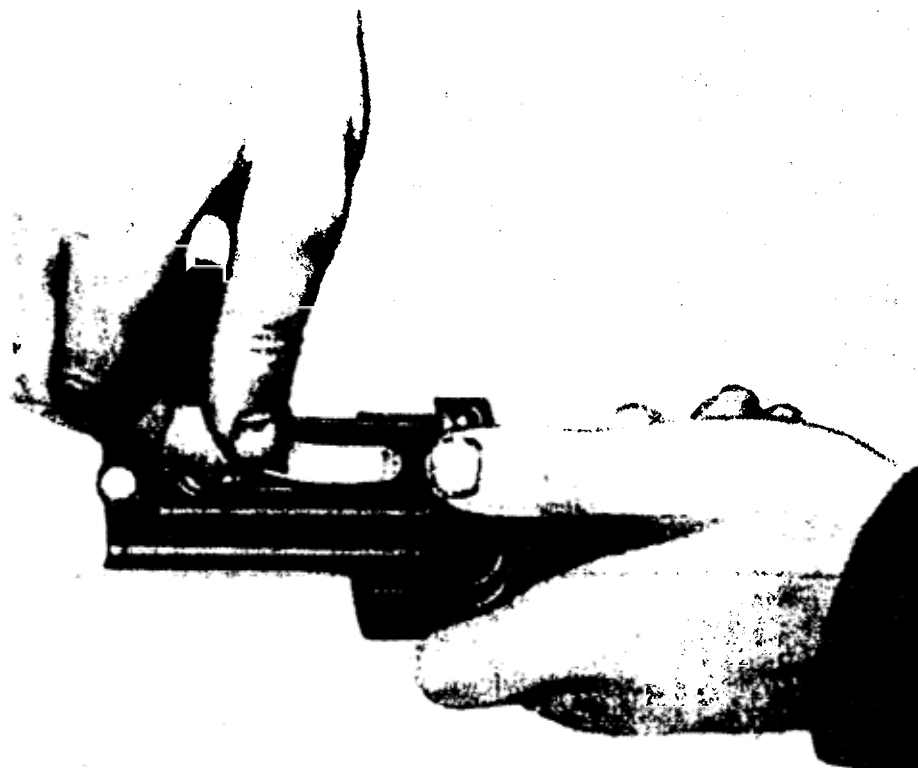


Figure 44. Detaching the leaf-spring

#### IV. INTERACTION OF THE PARTS DURING FIRING

The MG is loaded and secured. The breechblock is in the most rearward position and is held by the sear, the main spring is pressed together. The safety wing is shifted to the front, the round part of the safety has placed itself under the sear and prevents during the operation of the trigger the lowering of the sear. The filled cartridge belt is inserted in the feed mechanism. During the shifting of the safety wing to the rear, the safety shaft is turning, and the flattened part shows upward. The operation of the trigger presses the trigger cam on the trigger recess, which is lowered by the impact. The bolt assembly is thus freed and shoots forward by the force of the tightened main spring. The roller on the anvil of the feed mechanism slides in the curved guide rail of the transport lever and presses it to the right. By the mortise-and-tenon-joint of the transport lever with the belt feed pawl, the right-side movement of the transport lever is changed into the left-side movement of the belt feed pawl lever. The belt feed pawl lever, which with its front part is operating the belt feed pawl, presses the latter toward the left. The belt-feed lever, which is shock-mounted in the belt feed pawl, is pressed upward, glides over the next link of the cartridge belt and then places itself behind this link. The bolt assembly continues to glide forward. The expeller pushes the first cartridge out of the belt and leads it into the barrel. The bolt assembly strikes the breech piece and the extractor claw fastens itself in the ring nut of the cartridge base. The guide of the bolt assembly continues to glide forward. The beveled surfaces of the anvil press the support flaps apart, which then place themselves in the recesses of the casing and lock the barrel from the rear.

The front surface of the anvil strikes the firing pin, which with its tip enters through the front wall of the chamber and hits the percussion cap of the cartridge. This starts the firing. Under the pressure of the powder gases, the bullet leaves the barrel with increasing velocity. After the bullet has crossed the gas conduit, a portion of the powder gases is diverted to the regulator. The powder gases are passed on by the regulator to the gas chamber and are pressing on the front surface of the gas piston. The pressure on the gas piston is transmitted to the bolt guide and the bolt guide starts the return motion. The recess in the bolt guide, in which the lugs of the support flaps are placed, draws the support flaps together; the support flaps leave the recesses of the casing and the barrel is unlocked. The breech mechanism glides back and the extractor draws the cartridge case from the cartridge chamber. The ejector, which glides in the groove of the expeller, strikes the cartridge case base and expels the cartridge case downward.



The roller on the anvil of the bolt guide presses the transport lever to the left. The transport lever transmits the left-side movement to the right-side movement of the belt-feed pawl lever, which presses the belt-feed pawl to the right.

The belt feed lever, which during the forward glide of the bolt mechanism has placed itself behind the next link of the belt, pushes the belt one link to the right. During this movement, the belt-feed guide is pressed downward and the pressure lever upward, which then during the return movement place themselves behind the next belt link and the projectile respectively. The next cartridge is thus above the opening of the lower part of the belt-feed.

The bolt mechanism continues to slide back and presses the main spring together. The further return movement of the bolt mechanism is stopped by the block of the trigger frame.

This procedure continues until the trigger is released, the sear goes upward and the trigger cam of the bolt guide catches itself behind the sear.

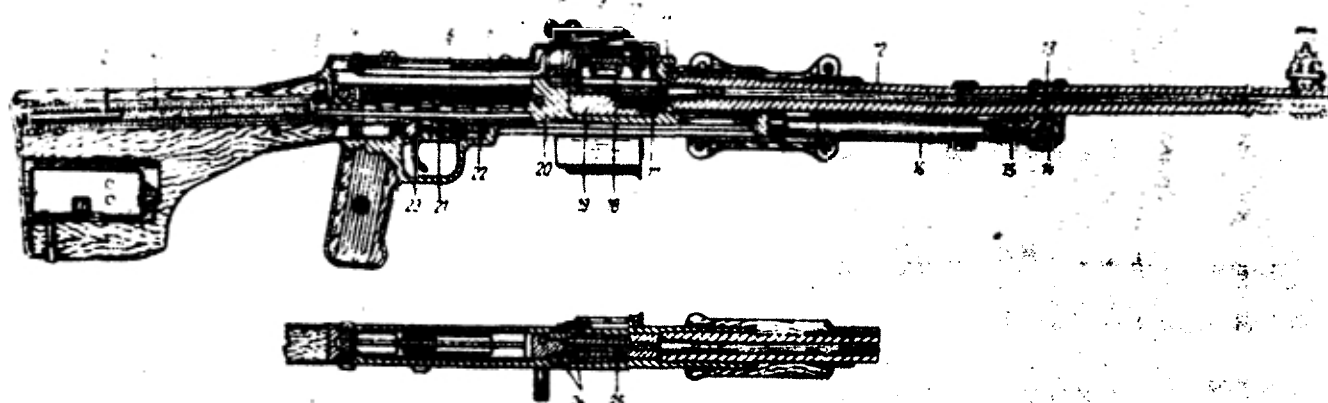


Figure 45. Position of the MG parts prior to loading: 1 - Main spring; 2 - main spring block; 3 - cleaning rod; 4 - cover-plate lock; 5 - casing cover-plate; 6 - transport lever; 7 - belt-feed pawl lever; 8 - ejector; 9 - belt-feed pawl with belt-feed lever; 10 - pressure lever; 11 - connecting lug; 12 - barrel; 13 - gas conduit; 14 - regulator; 15 - gas chamber; 16 - gas cylinder; 17 - extractor; 18 - belt-feed guide; 19 - bolt mechanism; 20 - bolt guide; 21 - safety device; 22 - sear; 23 - trigger; 24 - support flaps; 25 - firing pin.

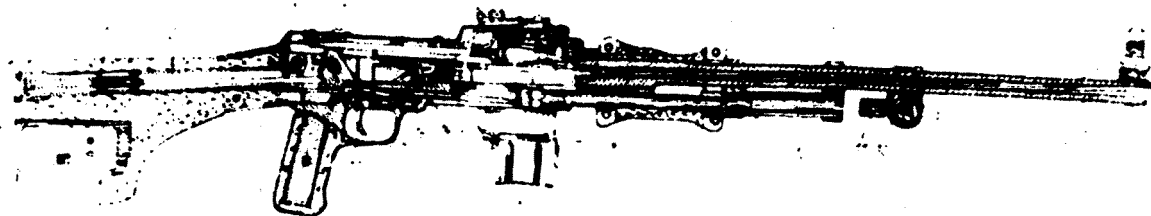


Figure 46. Position of the MG parts after loading: 1 - Main spring; 2 - cleaning rod; 3 - cover-plate lock; 4 - casing cover-plate; 5 - transport lever; 6 - belt-feed pawl lever; 7 - belt-feed pawl with belt-feed lever; 8 - pressure lever; 9 - gas conduit; 10 - regulator; 11 - gas chamber; 12 - gas piston; 13 - extractor; 14 - bolt mechanism; 15 - bolt guide; 16 - sear; 17 - trigger; 18 - firing pin; 19 - support flaps; 20 - drum; 21 - cartridge.

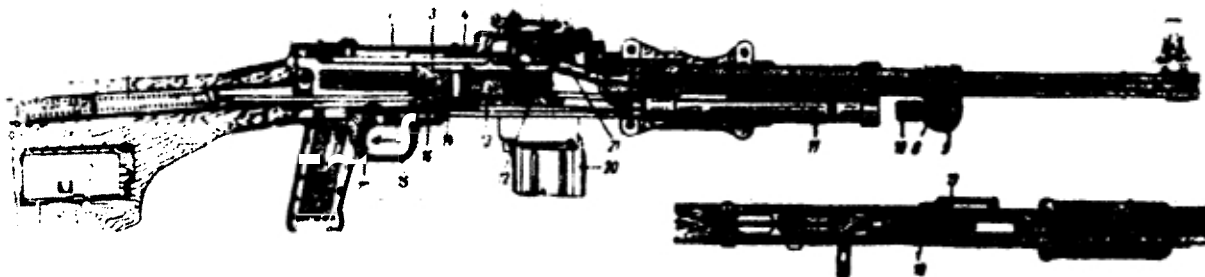


Figure 47. Position of the MG parts shortly before the discharge of the shot: 1 - Main spring; 2 - casing cover-plate; 3 - transport lever; 4 - belt-feed pawl lever; 5 - ejector; 6 - belt-feed pawl with belt-feed lever; 7 - pressure lever; 8 - gas conduit; 9 - regulator; 10 - gas chamber; 11 - gas piston; 12 - extractor; 13 - bolt mechanism; 14 - bolt guide; 15 - safety device; 16 - sear; 17 - trigger; 18 - support flaps; 19 - firing pin; 20 - drum; 21 - cartridge.

## V. TECHNICAL INSPECTION OF THE IMG

Technical inspections have to be carried out in accordance with the times prescribed in the garrison duty regulations. The technical condition is determined in accordance with the degree of readiness for action of the MG.

The MG must be examined daily before training, before and after firing and during the cleaning of the weapons.

The daily inspection of the MG is carried out in the assembled and disassembled state.

The accessories are to be inspected prior to each cleaning of the MG. The machine gunner must report to his superior immediately all deficiencies discovered during the inspection of the MG and of the accessories.

### 15. Daily inspection of the IMG

It must be checked during the daily inspection to determine:

- whether there are cracks, dents, rust, dirt, deep scratches on the metal parts or cracks and impact places at the butt or at the hand guard;
- whether threads are torn off or stripped;
- whether the moving parts, the main spring, the trigger installation, the safety mechanism and the feed mechanism are functioning faultlessly;
- whether the muzzle screw has been threaded on and is firmly attached on the barrel;
- whether the casing cover is held firmly in both opened and closed position;
- whether the indentation at the front sight protection agrees with the indentation at the front sight base and the adjustment of the sight notch agrees with the zero graduation at the scale;
- whether the accessories are in a satisfactory condition, are well arranged in the container, are in the recess of the butt, and whether the cleaning rod is at the right place;
- whether the sling hooks and the bipod are firmly attached and the carrier sling has been connected correctly to the hooks;

- whether the drums and belts are in order and the drums are firmly attached to the MG.

16. Inspection of the IMG in the assembled state

On this occasion it must be checked to determine:

- whether the serial numbers of the parts agree with each other;
- whether the muzzle sight is straight, is placed firmly in the boring of the muzzle sight protector and does not shift during firing;
- whether the muzzle sight protector sits firmly in the muzzle sight holder and cannot be moved by hand;
- whether the rear sight leaf returns to its former position when it is pressed to the side;
- whether the sight notch sits above the center mark of the scale with the figure "0" and moves laterally during the turning of the adjusting screw;
- whether the sight slide can be moved steadily and easily on the rear-sight leaf and is sitting firmly at each calibration;
- whether the underside of the rear sight slide is attached firmly to the slide support;
- whether the leaf spring holds the flap firmly in the corresponding position. The legs of the bipod must be kept in a spread position by the spring and must not be able to turn to the front or rear;
- whether the legs of the bipod are held in a rest position by the spring pressure piece and are attached by the pins that are engaged in the clip foot;
- whether the regulator is firmly held by the screw in the connecting piece and is accurately adjusted;
- whether the drum holder is bent and the drum block is under spring pressure;
- whether the trigger frame is firmly attached to the casing;
- whether the cover lock can be freely moved forward by hand pressure and quickly moves backward under pressure by the spring after release and whether it holds the cover with the notch firmly in the closed position;

- whether the spring lock of the upper part of the feed mechanism holds the cover securely after it has been opened;
- whether the cover of the butt plate is firmly attached to the butt plate and can be easily turned. The lock must reach out above the surface of the plate, must easily be pressed in with the finger, and must keep the cover firmly in a closed position;
- whether the accessories are complete and are accurately arranged in the container;
- whether the cartridge belts have rusted, bent or cracked links or defective connecting springs;
- whether the drum can be easily opened and can be attached and detached from the drum holder.

During the inspection of the MG in the assembled state, the functioning of the gliding parts and of the trigger installation and of the safety mechanism must also be checked.

On this occasion:

- the lock at the cocking slide must be pulled backwards to the stop; the movable parts must move easily and without restraint; the lock must remain in the extreme rear position;
- the safety wing must be shifted forward; it must remain in the most advanced position;
- the trigger must be operated; the bolt must remain in the extreme rear position;
- the safety wing must be shifted to the rear; it must jump to the extreme rear position and must engage firmly;
- the trigger must be operated; the bolt must snap forward forcefully and without restraint (the trigger must be easy to operate and must snap back to its original position when released);
- the MG must be placed in a perpendicular position (barrel upward), the cocking slide must be pulled so far to the rear that the front surface of the gas piston is in line with the rear section of the gas chamber; then release the cocking slide; the bolt must snap to the extreme forward position.

#### Checking the function of the feed mechanism

- Open the casing cover;

- press the transport lever at its rear end to the right up to the stop; then release quickly (repeat two or three times); both levers and the feed belt pawl must move easily and must return after release with a forceful movement to their initial position;
- close the casing cover;
- load the MG with 5 to 8 dummy cartridges;
- operate the trigger; during the forward movement of the bolt, the lock must push the cartridge easily from the belt to the cartridge chamber;
- bring the bolt mechanism again to the extreme rear position; during the return movement, the cartridge must be pulled out by the extractor and after the impact it must be thrown onto the ejector. The next link of the belt with the cartridge must be brought by the feed mechanism over the cartridge discharge of the lower part of the feed mechanism. (This procedure must be repeated until all cartridges have been ejected from the belt).

#### 17. Inspection of the IMG in the Disassembled State

The inspection of the MG in the disassembled state must take place in the presence of the squad leader or platoon leader. Prior to the inspection of the disassembled MG, all parts have to be cleaned and dried. During the inspection, each part must be examined and attention must be paid that all numbers of the parts correspond.

##### a) Inspection of the barrel

The barrel must be held at eye level and turned against a light place; it has to be looked through from the muzzle and then from the cartridge chamber. The barrel must be turned around its axis and be kept at a distance of from 50 to 70 mm from the eyes. During the inspection of the bore, the following can be detected:

Formation of rust as a brown coating at individual places or in the entire barrel.

Copperplating in the form of a reddish coating in the barrel.

Wear and tear of the lands, especially at the beginning of the grooves and at the barrel muzzle.

Bulging of the barrel, which appears in the form of a shadow transverse ring.

Barrel warping, which can be detected by a special shadow formation in the barrel (figure 48).

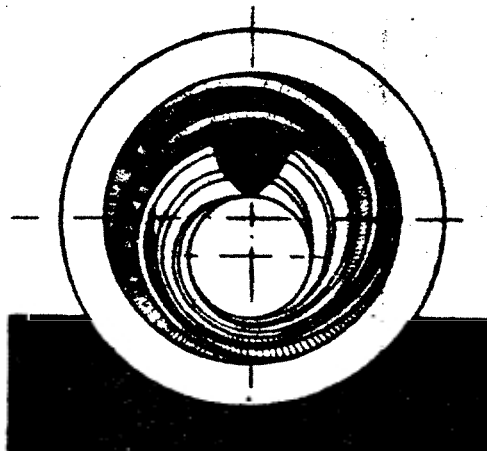
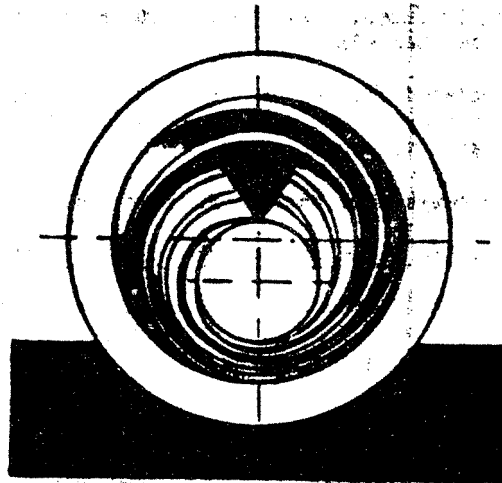
In order to be able to detect barrel warpings, the barrel must be directed to the horizontal lower edge of an object (window frame, blackboard, etc.). In a straight barrel, one sees a shadow in the form of an equilateral triangle. The form of the shadow triangle must not change during the rotation of the barrel.

In a warped barrel, the sides of the triangle are warped and undergo a change during the rotation of the barrel. If the warping of the barrel is excessive, the shadow triangle is interrupted, or the sides are shifted.

The internal surface of the barrel is chromeplated. Chromium-plated barrels have special characteristics which, however, have no influence on the combat properties.

These peculiarities are dull sliding surfaces, ring shadows, spiral stripes on the chromium-plated surface, powder network and breaks in the chromium.





**Figure 48.** Shadow triangles in the bore  
a - in a straight barrel; b - in a warped barrel.

Dull sliding surfaces, ring-shadow and spiral stripes can occur in new and used barrels.

In chromium-plated rifling net-shaped barrel erosion and scaling of the chromium are unavoidable and are not defects, for the barrel maintains its accuracy of fire.

Barrels with net-shaped barrel erosions must be carefully cleaned.

b) Inspection of the bipod and its attachment to the MG

The bipod must be firmly attached to the barrel and must turn in the clamping collar. The legs of the bipod must not be bent; the spring lock must keep the legs firmly together in the folded state (marching position).

c) Inspection of the casing and of the belt-feed

The casing must be firmly connected with the barrel, and the ejector must be firmly inserted in the bridge.

The drum holder must be firmly attached to the casing and must not be shaky; the connecting bolt must be secured against dropping out by the lock in the boring of the casing.

The upper and lower parts of the belt-feed must be firmly connected by the axis.

The lower part of the belt-feed must sit firmly in the recess of the casing, must not have any loose rivets, and the recoil guard must not be bent.

If the belt-feed guide is pressed with the finger, it must compress and must square off with the lower part of the belt-feed. If released it must move upward forcecullly under the pressure of the spring tension; the belt-feed pawl must forcefully glide in the grooves of the upper part of the belt-feed; the belt-feed and belt-feed lever must be under spring pressure.

d) Inspection of the hand guard

The hand guard must be firmly attached to the MG. The screws of the hand guard must be screwed in until the stop, and must not turn together with the nuts of the left half of the hand guard.

The overlays must lie closely to the inside and outside of the hand guard, and the punched-out shoulders of the overlays must not be pressed in; the nuts must be firmly in the openings of the hand guard sides.

e) Inspection of the bolt mechanism and of the main spring.

Wear and tear of the front surface of the bolt mechanism are admissible only when the extractor claw during the return movement of the lock holds the cartridge case; the support flaps must not wear out; the firing pin must move freely in the chamber; when force is applied with a finger against the rear end of the firing pin, the firing pin tip must enter through the front wall of the chamber; the locking pin of the firing pin must sit firmly in the boring and must not slip out; the extractor must be pressed by the spring; the locking pin must sit firmly.

The bolt guide must not have any cracks, bent places or dents at the guide rails or walls; the roll must sit tightly on the axis and must freely rotate on it. The axis of the roll must be firmly inserted in the boring of the anvil of the bolt guide.

The gas piston must be connected with the bolt guide (a slight play is admissible); the locking pin of the piston must sit firmly in the boring and is not allowed to protrude; the piston must go freely into the gas-chamber.

The main spring must be connected with the pressing rod and it must be possible to set it easily on the block. The coils of the spring must not be bent.

The pressing pin and the block must not be bent and must sit firmly in the slide lock of the piston.

f) Inspection of the trigger frame with piston and trigger installation

The safety device must be held by the safety spring in the forward and rear positions. If the safety wing is shifted forward, then the sear nose must not lower itself during pressure on the trigger. If the safety wing is shifted to the rear, then the sear nose must lower itself during pressure on the trigger. An insignificant rounding off of the sear nose is admissible if the bolt guide is held in the extreme rear position. The locking pin of the trigger must be firmly set in the boring and must not shift; the gun stocks must be firmly attached to the frame; the connection of the trigger frame with the piston must not be loose.

g) Inspection of the casing cover

The axis of the belt-feed pawl guide, the rivets of the transport lever spring and the rivets of the rear sight base on the cover are not permitted to be loose.

The rivets at the cover lock also are not allowed to be loose. The cover lock must be freely movable on the cover and must be under spring pressure.

The cover lock screw must be firmly screwed into the guide rail of the cover and connect the cover lock with the cover.

h) Inspection of the accessories

The accessories must be complete; the oil can must be filled with oil; the cleaning rod must not be bent and the thread not worn; the regulator key must have no cracks and broken places. The blade of the screw driver must not be broken; the front sight key must have no cracks or dents. The reamer for the cleaning of the gas routes must have no damaged teeth; the extractor must have no indentations at the ring-shaped shoulder of the split tube; the cleaning rod top must turn itself with its revolving part around the shaft and must have no edges; the punch and the toggle must not be bent. The accessories container must have no dents at the casing and cover; the cover must in the closed state be locked by the block.

The muzzle cap must have no dents and torn-off threads around the entrance opening for the cleaning rod; the oil can must have no dents or cracks at the casing; the oil can must not loose any oil through the plug or through its seams; the covering and the bags for the drums must be dry and clean.

## VI. PREPARATION OF THE IMG FOR FIRING

The MG must be prepared as follows:

- The MG must be inspected in the disassembled and assembled state;
- belts, drums and cartridges must be inspected;
- belts have to be filled with cartridges and placed in the drums.

During the preparation of the MG for firing, the drum with the filled belt must not be attached to the MG; it must be attached only on the firing line, shortly before firing.

Immediately before the firing, the barrel must be dried and the movability of the gliding parts must be examined.

After firing, the MG must be unloaded and inspected. Loaded MG's must not be left at the firing line.

The MG must be disassembled, assembled, cleaned, oiled and inspected strictly in accordance with the corresponding sections of this regulation only.

### 18. Belting of the cartridges and insertion of the belt in the drum

Before filling the ammunition belts, inspect the cartridges. If the belts are defective, they must not be filled with live cartridges or with drill or blank cartridges.

The cartridges must be placed in the belts as follows:

- Take the belt into the left hand in such a way that the opening of the links point upward, the directional attachment to the front, and the traversing stop to the rear;
- shove the cartridges into the belt links from the traversing stops with the cartridge points forward to such a degree that the traversing stops snap into the circular grooves at the cartridge case bottom;
- if less than 100 cartridges are to be filled into the belts, the filling will have to start at the connecting piece or last link.



Figure 49. Placing cartridges in the belt

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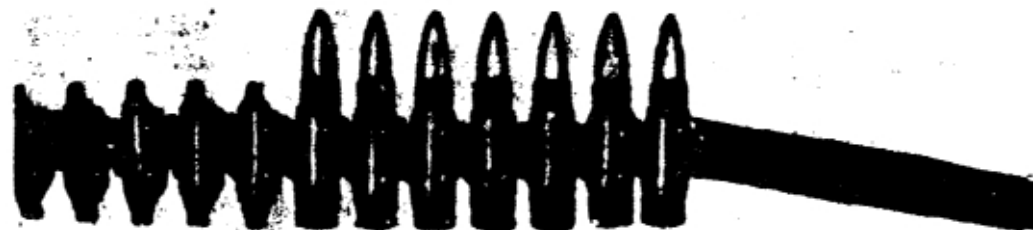


Figure 50. Correctly-filled cartridge belt

If single rounds are to be fired, live and drill cartridges must alternately be placed in the belt to avoid stoppages. (The last cartridge must be a drill cartridge).

Two belt ends are to be connected as follows:

- Take the belt end with the connection piece into the left hand and place with the right hand the connection piece of the first belt end through the large opening into the connection link;
- Shove with one finger of the left hand the connection piece from the inside in such a manner against the connection link that the connection lug snaps into the small opening of the connection piece;
- shove one cartridge into the connection piece.



Figure 51. Connecting two belt-ends by means of the connecting link and the connecting piece.



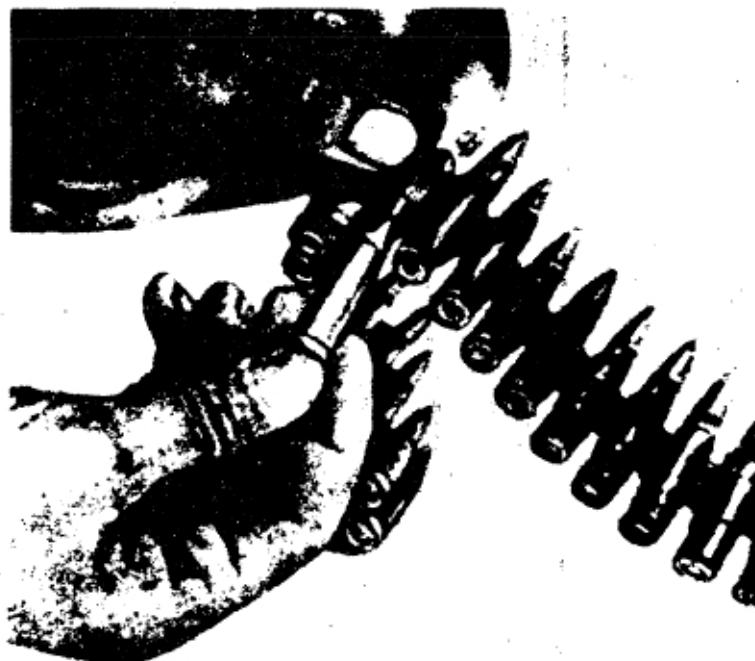


Figure 52. Inserting the cartridge in the connecting link

The filled belt is to be placed into the drum as follows:

- Open the drum cover;
- roll the belt, starting from the last link, in such a manner that the open sides of the links point inward;
- place the rolled-up belt into the drum in such a way that the projectile points are directed towards the drum bottom;
- draw the belt end piece through the window of the drum towards the outside;
- close the drum cover and secure it by the lock.



Figure 53. Placing the filled belt into the drum

19. Adjustment of the regulator

With MG's that are delivered by the factory (warehouse), the regulator is set for average adjustment, i.e. the lock of the regulator sits in recess 2 of the regulator rim.

After the firing of about 1,000 to 1,500 rounds, the gliding parts are well run in, and the force of the recoil becomes too great.

The regulator is to be adjusted to the smallest gas conduit, i.e. recess 1 at the regulator rim is to be brought in agreement with the regulator lock. The largest conduit of the regulator is used when the movable parts are dirty and when there is no possibility to clean them, or during firing at low temperatures.

The regulator must be adjusted as follows:

- Loosen the regulator screw with the regulator key by about two or three turns;
- loosen the rim of the regulator from the lock;
- press the regulator out toward the right and make the desired agreement correspond with the lock;
- press the regulator toward the left and turn the screw again up to the stop.

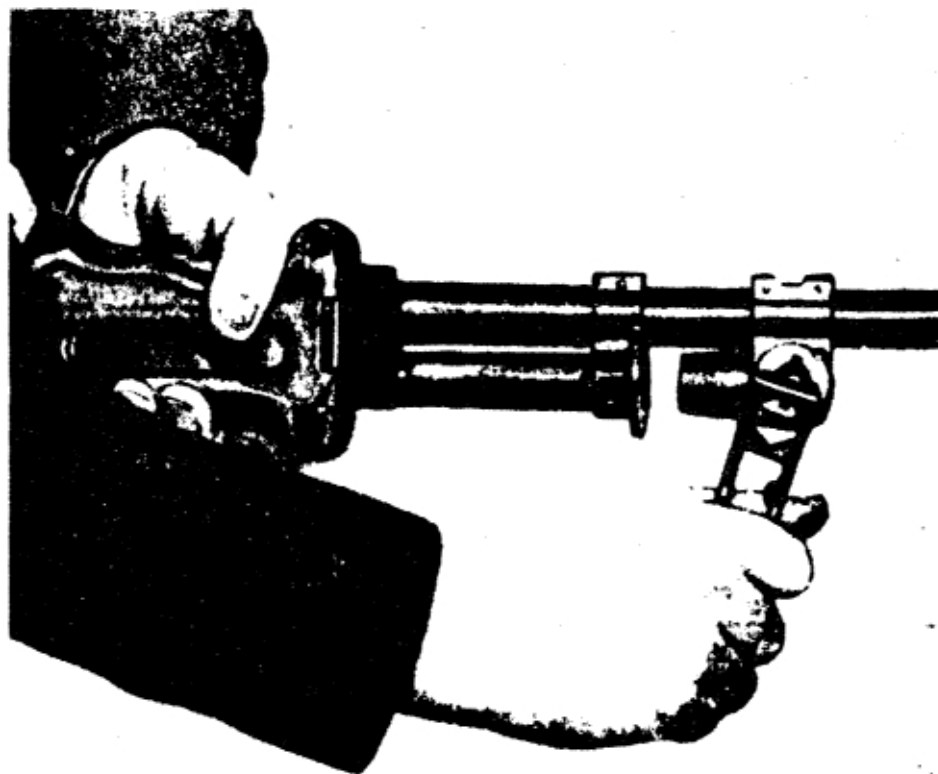


Figure 54. Adjusting the regulator

## VII. HANDLING OF THE LMG IN THE FIRING POSITION

### 20. Emplacement of the LMG

The MG must be set up in the firing position in the line of fire. The end spurs of the bipod must be sunk into the ground. This gives the MG a firmer stand during firing and it obtains a directed recoil.

However, the bipod must not be dug in, for this impairs the accuracy of fire.

### 21. Adjustment of the sight

The thumb nut of the sight slide must be pressed together with the right thumb and index finger, and the sight slide must be shifted on the rear sight leaf to the corresponding scale division.

After that the thumb nut must be released and it must be verified whether the slide remains at the set distance.

After the adjustment of the sight, the adjustment of the sight notch must be checked. If the sight notch is displaced to the side, it must be placed on "0" by means of the adjusting screw. When firing with a strong side wind, adjust the sight notch opposite the direction of the wind.

If the sight notch is displaced by one scale division, the mean point of impact shifts with regard to the point of aim by 2/1000 of the firing distance.

Table of the Lateral Shifting of the Sight  
Notch in Scale Divisions

(The wind is blowing at an angle of 90° to the direction of fire)

Wind velocity in m/sec	4	6	8
Range in m	Adjustment in scale divisions against the direction of the wind		
100	-	-	-
200	1/2	1/2	1/2
300	1/2	1	1
400	1	1 1/2	2

500	1	2	2
600	1 1/2	2	3
700	2	3	4
800	2	3 1/2	4 1/2

## 22. Loading the LGM

The MG can be loaded with open or closed casing cover.

With closed casing cover, the MG can be loaded only if the belt is filled completely with cartridges.

### a) Loading the LMG with closed casing cover

Let down the tightening handle with the right thumb. Grasp the tightening handle with the right hand and draw it back to the stop. (Bring bolt mechanism to the extreme rear position). Shove the cocking slide forward and let it engage in the holding recess; shift the safety wing forward (the MG is on safe). Grasp the MG with the right hand at the small of the stock and lift it somewhat; take the drum with the left hand in such a way that the carrying lug points to the left; shove the drum with the guide rails on the drum holder; shift the drum stop downward; stick the end piece of the belt from the left through the notch of the belt-feed; grasp the end piece with the right hand and draw it toward the right unto the stop. The MG is loaded and secured.



Figure 55. Attaching the drum to the drum-holder



Figure 56. Securing the drum with the drum lock

500	1	2	2
600	1 1/2	2	3
700	2	3	4
800	2	3 1/2	4 1/2

## 22. Loading the LMG

The MG can be loaded with open or closed casing cover.

With closed casing cover, the MG can be loaded only if the belt is filled completely with cartridges.

### a) Loading the LMG with closed casing cover

Let down the tightening handle with the right thumb. Grasp the tightening handle with the right hand and draw it back to the stop. (Bring bolt mechanism to the extreme rear position). Shove the cocking slide forward and let it engage in the holding recess; shift the safety wing forward (the MG is on safe). Grasp the MG with the right hand at the small of the stock and lift it somewhat; take the drum with the left hand in such a way that the carrying lug points to the left; shove the drum with the guide rails on the drum holder; shift the drum stop downward; stick the end piece of the belt from the left through the notch of the belt-feed; grasp the end piece with the right hand and draw it toward the right unto the stop. The MG is loaded and secured.



Figure 55. Attaching the drum to the drum-holder



Figure 56. Securing the drum with the drum lock



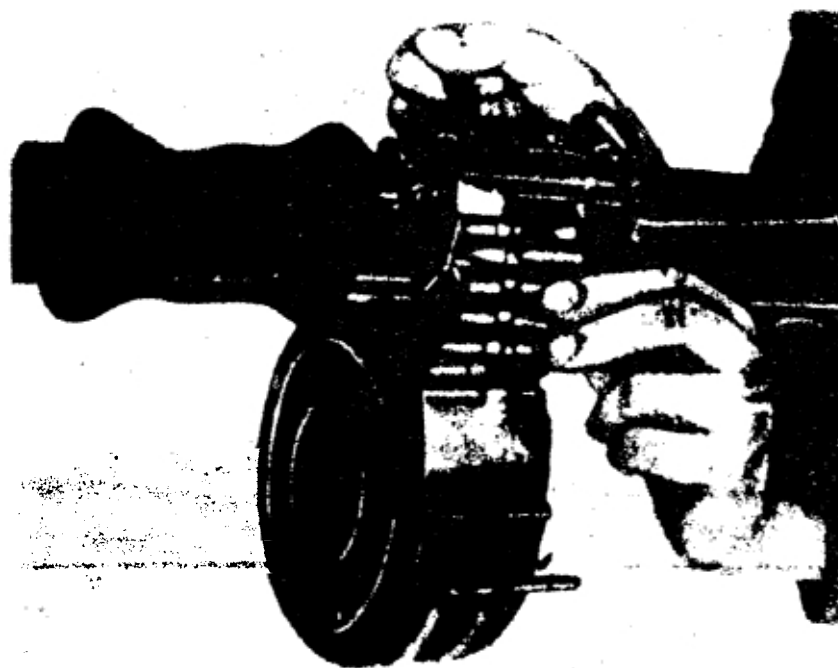


Figure 57. Loading the MG with closed casing cover-plate

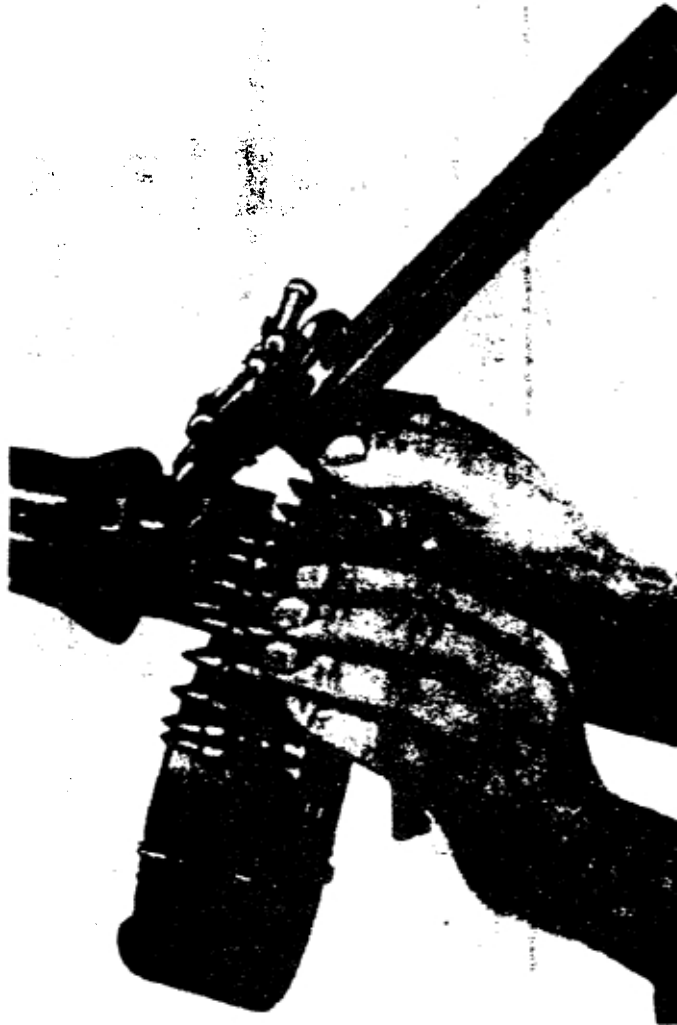


Figure 58. Loading the MG with opened casing cover-plate

b) Loading of the MG with open casing cover

Cocking and securing, as well as attaching the drum, are done in the earlier described manner.

Shove the cover-plate lock forward and open the casing cover-plate; place with the right hand the belt on the support of the lower part of the belt-feed and draw to the right up to the stop; press with the left hand the belt on the support of the lower part of the belt-feed; close the casing cover-plate with the left hand.

The MG is loaded and secured.

23. Sighting with the LMG and firing

Sighting with the LMG is carried out as follows:

- Lift the butt with the left hand and press it firmly into the right shoulder;
- release the safety (shift the safety wing backward with the right hand);
- span the grip with the right hand, at the same time placing the stretched-out index finger alongside the trigger guard;
- sight the point of aim over sight-notch and muzzle-sight; squeeze the trigger evenly with the index finger.

After the delivery of bursts, sighting must be readjusted during pauses between firings. To cease fire, release the trigger. The bolt mechanism remains in the extreme rear position; the MG remains loaded and is ready for further firing.

After the consumption of all cartridges stored in the belt, the bolt mechanism remains in the extreme forward position. The MG must again be readied for firing. The empty drum must be removed and must be replaced by a filled one, the MG must be cocked and secured.

#### 24. Unloading the LMG

The LMG must be unloaded as follows:

- Secure the MG; shove the cover-plate lock forward with the right hand and open the casing cover-plate; detach the belt with the left hand from the lower part of the belt-feed;
- check to make sure that there are no cartridges in the cartridge chamber;
- close the casing cover-plate; release the safety and pull the cocking-slide back; operate the trigger with the left hand; let the bolt mechanism move slowly about two-thirds forward; let go of the cocking grip and let the bolt mechanism engage audibly;
- let the cocking grip swing upward; turn the drum lock upward and draw the drum from the drum holder toward the rear.

After unloading, open the drum cover; the remaining cartridges must be removed from the belt; the belt must be inserted in the drum, and the drum must be closed.

#### 25. Measures to prevent and eliminate stoppages

With maintenance according to regulations, correct storage and appropriate handling, the MG is a reliable and stoppage-free weapon.

With improper handling, fouling and erosion of the parts after long use, as well as by the inferior quality of the cartridges, stoppages can occur during firing.

Most of the stoppages can be eliminated if the MG is once more loaded.

Causes for stoppages may be:

- Bad preparation of the MG for firing or incorrect loading;
- erosion and damaging of parts;
- damaging of the belt or cartridges.

In order to prevent stoppages during firing, the MG must be

- cleaned, inspected and oiled at the determined periods,
- repaired in time,
- prepared correctly for firing,
- safeguarded from fouling and blows during handling and firing.

Before the rounds are placed into the belts, the cartridges and the belts must be checked.

- After prolonged firing, the first opportunity must be used to clean and lightly oil the gas routes, the barrel, the gas cylinder, the gas piston and the gliding parts.

At low temperatures, the bolt mechanism must be drawn forward and backward several times prior to loading. If a stoppage occurs during firing, the MG is to be reloaded and the firing is to be continued.

If the stoppage cannot be eliminated by loading, the MG must be unloaded, the cause must be established and the stoppage eliminated.

Stoppages During Firing and Their Elimination

Stoppages	Causes	Elimination
Bolt mechanism does not move easily forward. Cartridge is introduced into the cartridge chamber but not ignited.	-- MG is soiled; -- oil on the gliding parts resinified; -- main spring is weak or broken.	Pull bolt mechanism back and continue firing. With repeated stoppage, unload the MG, disassemble it in part and clean it, or open the casing cover-plate, oil bolt assembly, bolt guide and belt feed. Replace defective main spring.

Stoppages	Causes	Elimination
Bolt mechanism glides easily forward, but stops in the center position. Shot does not break.	-- Cartridge chamber, gas piston and gas chamber are soiled by powder slime; cartridge defective.	Pull bolt mechanism back and continue firing. If stoppage is repeated, clean cartridge chamber, gas piston and gas chamber. Remove defective cartridge.
Bolt mechanism has sped to the extreme forward position, but the round did not fire.	-- Cartridge defective; -- the striker does not protrude far enough; -- striker is broken off.	Pull bolt mechanism back and continue firing. If the failure is continued, inspect the MG and if a break of the striker is established, bring the MG to the arms repair shop.
Bolt mechanism has not sped to the extreme forward position. The cartridge case has been wedged between the bolt guide and the casing.	-- Extractor claw is broken or worn; -- spring of extractor is weak or broken; -- ejector is worn, broken or loosened.	Open casing cover-plate, pull bolt mechanism back, detach belt, remove the cartridge case or cartridge that is wedged between the bolt guide and the casing from the cartridge chamber, load the MG and continue firing. If the stoppage is repeated, disassemble the MG and establish the cause. If the ejector is defective, take the MG to the arms repair shop.
Bolt mechanism has not sped to the extreme forward position because the introduced cartridge has hit upon a cartridge case that was still in the cartridge chamber.	-- Cartridge chamber is dirty; -- extractor or extractor spring is broken or worn.	Pull bolt mechanism back, open casing cover-plate, remove belt and take out the introduced cartridge, operate the trigger and thus bring the bolt mechanism to the extreme forward position, attempt by retraction to draw the cartridge case from the cartridge chamber.  If the cartridge case is retracted, clean and oil cartridge chamber and continue firing. If the cartridge case is not retracted, push the cleaning rod through the muzzle of the barrel.  If the extractor or the extractor spring is defective, take the MG to the arms workshop.

Stoppages	Causes	Elimination
After the trigger is released, the MG continues firing.	<ul style="list-style-type: none"> <li>-- Bolt assembly, bolt guide, belt-feed and the gas routes are dirty;</li> <li>-- trigger installation is defective;</li> <li>-- trigger sear and cocking lug are worn.</li> </ul>	Hold the belt with the left hand to stop the firing. Clean the MG or open the casing cover-plate and oil the gliding parts or adjust the regulator to a larger channel. If this does not help, bring the MG to the arms repair shop.
Bolt mechanism has not sped to the extreme forward position. The cartridge does not enter completely the cartridge chamber because the front part of a cracked cartridge case is in the cartridge chamber.	<ul style="list-style-type: none"> <li>-- The quality of the cartridge case is poor;</li> <li>-- the cartridge chamber is dirty;</li> <li>-- the support flaps and the recess for the support flaps are worn.</li> </ul>	Pull bolt mechanism back. Open casing cover-plate, insert the extractor in the cartridge chamber, uncock the bolt mechanism and then withdraw it with a quick movement. In doing so, the cartridge case tip must be at the shaft of the extractor.
The bolt mechanism is in the extreme forward position. No cartridge has been fed.	<ul style="list-style-type: none"> <li>-- A cartridge has fallen from the belt link;</li> <li>-- connection piece and connection link are defective;</li> <li>-- during the filling of the belts, the belt ends were incorrectly connected;</li> <li>-- the belt-feed pawl is jammed, or the spring of the belt-feed lever is broken;</li> <li>-- the bolt mechanism is not completely retracted because of accumulated dirt.</li> </ul>	Retract the bolt mechanism and continue firing. If the stoppage is repeated, clean the MG and inspect the belt-feed. If it is defective, take the MG to the weapons workshop.

VIII. EXAMINATION OF THE ACCURACY OF FIRE AND  
THE TESTING OF THE LMG

26. The LMG must be tested:

- After the delivery to the unit;
- after the repair of parts that influence the accuracy of fire;
- if during firing abnormal deviations of the bullets have been discovered.

The MG is to be tested first with four rounds single-shot fire and then with eight rounds in three to four bursts, with evaluation after each burst.

The testing is to be supervised by the platoon leader or by the company or battery commander. The superior officers, including the regimental commander, are obligated to pay attention that the regulations are strictly adhered to.

The MG's are to be tested by confirmed sighting marksmen in the presence of the MG-gunners and the platoon leaders.

An armorer with the necessary equipment must also be present.

Prior to the testing, the MG's have to be inspected in accordance with these regulations and prepared for firing.

The MG's are to be tested only under favorable circumstances, i.e., during clear and calm weather or in a section of the firing range protected from the wind.



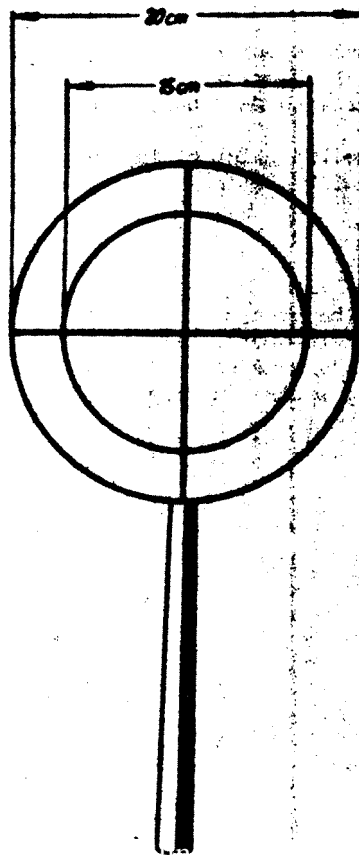


Figure 59. Sighting shot signaling disk for the examination of the hit density.

### Testing requirements

Distance	100 m
Sight	3
Single-shot fire	4 cartridges
Zone of dispersion	15 cm Ø
Deviation of the median point of impact from the check point	5 cm
Automatic fire (three to four bursts)	8 cartridges
Zone of dispersion	20 cm Ø
Deviation of the median point of impact from the check point	5 cm
Practice target	100 x 50 cm
Anchor	35 x 25 cm
Check point	24 cm above the point of aim
Number of hits in the zone of dispersion in single-shot fire	at least 3
Number of hits in the zone of dispersion during automatic fire	at least 6.

27. Testing the LMG During Single-Shot Fire

After the delivery of four rounds of single-shot fire, the hit density must be examined and the median point of impact must be determined.

The hit density is normal if all four hits (or in an extreme case three hits if one of them deviates greatly from the others) lie within a circle with a diameter of 15 cm.

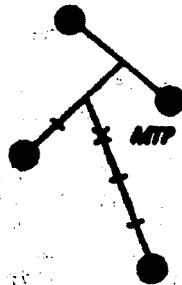


Figure 60. Determination of the median point of impact.

If the hit density does not meet this requirement, the MG must be inspected, the sight setting must be examined and the firing must be repeated.

If after repeated firing the hit density is not fulfilled, the MG must be taken to the ordnance repairshop.

If the hit density corresponds with the above-mentioned requirements, the median point of impact must be determined.

The median point of impact is determined as follows:

- Connect two hits that are close to each other by a line and halve the distance between them;
- connect the determined point with a third hit and divide the distance between them into three equal parts;
- connect the division point that is closest to the first two hits with the fourth hit and divide the distance between them into four equal parts. The point that is closest to the hits that were connected first is the median point of impact.

If the hits are in a symmetrical position, the median point of impact can be ascertained in the following manner:

- Connect the hits next to each other in pairs, halve the two lines, connect the obtained points by a line and halve it. The division point is the median point of impact;
- connect the hits crosswise by straight lines. The point of intersection of these lines is the median point of impact.

If one hit has deviated considerably from the others, it is to be neglected and the median point of impact is to be ascertained from the three other hits. For this purpose, two hits have to be connected by a line, the center of this line is to be connected with the third hit; the line obtained in this manner is to be divided in three equal parts. The point that is closest to the hits that were connected first is the median point of impact.

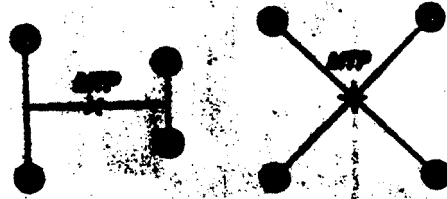


Figure 61. Determination of the median point of impact at a symmetrical hit position.



Figure 62. Screwing the front  
sight in.



Figure 63. Unscrewing the screw of the front sight holder.

If the median point of impact deviates more than 5 cm from the check point, the position of the front sight or of the front sight protection must be changed, i.e. if the median point of impact is too low, the front sight must be screwed in, and if the median point of impact is too high it must be unscrewed.

If the median point of impact is left (right) of the check point, the front sight protection must be moved to the left (right).

After the position of the front sight has been changed, the MG must be tested once more. The front sight protection is to be adjusted as follows:

Loosen the front sight screw with a key (three to four turns), move the front sight protection with hammer and punch sideways, tighten the screw and screw down the nut.

It is prohibited to unscrew the front sight screw without loosening the nut. The threading or unscrewing of the front sight by one turn (1 mm) or the lateral movement of the front sight protection by 1 mm changes the position of the point of impact during firing at a distance of 100 m by 17 cm.

The amount of front sight adjustment is determined by multiplying the deviation of the median point of impact from the check point with the correction coefficient.

The correction coefficient for the MG at the given requirements, distance 100 m, sight 3, length of the line of sighting 595.5 mm, amounts to 0.0595. (The correction coefficient permits deviations of 1 cm).

Example:

- a) The median point of impact has deviated from the check point 16 cm toward the right and 8 cm upward. The front sight protection is to be moved by  $0.0595 \cdot 16 = 0.952 \text{ mm}$  = 1 mm to the right, and the front sight is to be unscrewed by  $0.0595 \cdot 8 = 0.476 = 0.5 \text{ mm}$ .
- b) The median point of impact has deviated from the check point 25 cm toward the left and 20 cm downward. The front sight protection is to be moved by  $0.0595 \cdot 25 = 1.4875 \text{ mm}$  = 1.5 mm to the left, and the front sight must be screwed in by  $0.0595 \cdot 20 = 1.19 \text{ mm} = 1.2 \text{ mm}$ .

Remark: The deviation of the median point of impact is multiplied with the correction coefficient, and the result is obtained in mm.



## 28. Testing of the LMG During Automatic Fire

After the delivery of eight rounds in three or four bursts, the hit density must be examined and the median point of impact determined. The hit density of the MG is normal if not less than 6 hits are within a circle having a diameter of 20 cm.

After automatic fire, the median point of impact is to be determined as follows:

- The hits with the greatest deviation are neglected;
  - above or below half of the remaining hits are to be counted and divided by a horizontal line;
  - in the same manner, half of the hits are to be counted and divided from each other by a vertical line;
- The point of intersection of the vertical and horizontal line is the median point of impact.

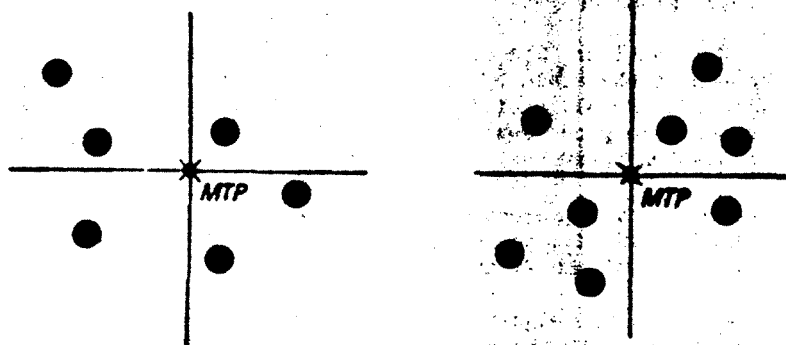


Figure 64. Determination of the Median Point of Impact During Automatic Fire.

Shortcomings of the Weapon Which Influence the Accuracy of  
Fire and Their Elimination

- a) The front sight is bent; the bullets deviate to the side opposite the misalignment of the front side tip.

If the median point of impact during automatic fire deviates more than 5 cm from the check point, the front sight must be adjusted.

Elimination: Unscrew the front sight, straighten it and screw it in again. If the front sight cannot be straightened it must be exchanged. After this repair, the MG must be tested.

- b) The rear-sight leaf is bent. The bullets are deviating toward the misalignment of the sight notch recess.

Elimination: In case of insignificant misalignment of the sight notch recess, move the front sight protection in the direction of the misalignment of the sight notch recess. Then test the MG.

- c) The zero-notch of the scale has shifted toward the sight notch. The bullets deviate in the direction of the sight notch misalignment.

Elimination: The sight notch must be placed on the zero-notch of the scale by turning the adjusting screw. Then test the MG. Should an independent misalignment of the sight notch take place during firing, the front sight cam or adjusting screw must be replaced.

- d) The front sight protection has shifted laterally. The bullets deviate in the direction opposite to the misalignment of the front sight protection.

Elimination: Adjust the front sight protection in accordance with the notch on the front sight holder and fasten it with the screw. Then test the MG.

## IX. CLEANING AND LUBRICATING THE LMG

### 29. The LMG Must Be Cleaned and Lubricated

- after tactical training, firing practice, drill or after prolonged exercises on the terrain = daily;
- after firing = immediately after firing practice (clean it on the firing range and lubricate it -- complete cleaning at the barracks). During the next 3 or 4 days, the barrel is to be cleaned and oiled daily.
- when not constantly in use = at least once a week.

The MG is to be cleaned and oiled by the machine gunner under supervision of the squad leader.

#### The squad leader is obligated:

- to determine when and to what extent the MG must be disassembled, cleaned and lubricated;
- to check the accessories and cleaning materials as to their condition;
- to check the cleanliness of the MG parts and, after the parts are clean, give the permission for the oiling and assembling of the MG.

The platoon leaders and company commanders must periodically inspect the cleaning of the weapons.

### 30. For cleaning and Oiling are to be Used:

- a) Soapy water or soda solution  
(for the elimination of the powder slime and for the cleaning of the parts that are exposed to the effect of the powder gases);
- b) lubricating oil  
(for the oiling of all metal parts of the MG after cleaning);
- c) clean soft rags and cotton wicks  
(for the cleaning and oiling of the MG);

- d) circular brushes and clean paint brushes  
(for the cleaning and oiling of the barrel, cartridge chamber, regulator and gas cylinder).

Other cleaning materials, oils and fats must not be used, for they may cause damage to the weapon. Recesses and borings can be cleaned with wooden spatulas.

### 31. Sequence of cleaning and lubrication

The MG is to be cleaned as follows:

- Unscrew the muzzle screw;
- insert the cleaning rod in the opening of the muzzle attachment, screw on the cleaning attachment and set the punch in the boring of the head at the cleaning rod;
- fold the cleaning wick like a figure 8, set up the point of intersection of the eight on the front side of the cleaning attachment and wind the loops of the wick around the cleaning attachment;
- moisten the wick with soap or soda solution, shove the cleaning rod with the cleaning attachment and the wick into the barrel and screw the muzzle attachment onto the barrel.

Move the cleaning rod evenly seven to ten times forward and backward through the barrel, replace the wick, saturate it with a soap or soda solution and continue the cleaning, remove the soap or soda solution from the cleaning rod, draw clean and dry cleaning rags through the barrel and the cartridge chamber; screw the oil brush onto the cleaning rod and oil the barrel and cartridge chamber.

Draw a cleaning rag, wound around a spatula and moistened in a soap or soda solution, through the regulator and the gas chamber.

Note: During the elimination of the powder slime from the gas conduit, the cleaning rod must be placed into the barrel.

The casing must be cleaned with a dry cleaning rag and then oiled. The gas cylinder must be washed with a soap or soda solution and then dried and lubricated.

All other parts of the MG must be cleaned with a dry cleaning rag and oiled. Wooden parts (butt and hand guard) must not be oiled.

At drills, during marches, in battle and at high temperatures and in sandy terrain, the MG's and cartridges must be especially protected from dust.

After prolonged firing in dusty air, the belt-feed, the bolt mechanism and the casing must be periodically cleaned and oiled. For that purpose, the MG is not disassembled; only the casing cover-plate is opened and the bolt is cocked.

If firing takes place during high temperatures, the MG's and especially the cartridges, must be protected against a prolonged and direct effect of the sun, for an intense heating of the metal, especially of the cartridges, can cause stoppages.

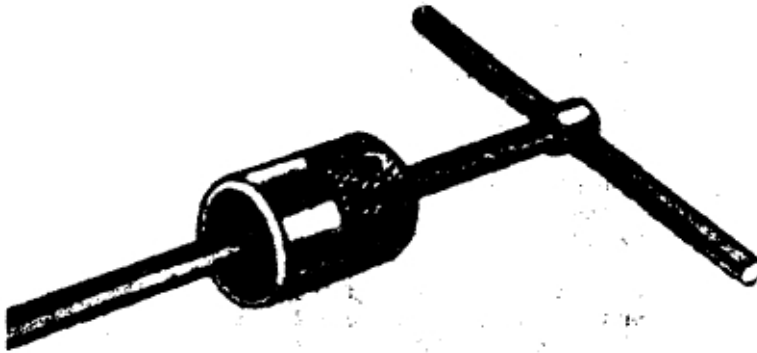


Figure 65. Inserting the Muzzle Attachment on the Cleaning Rod.

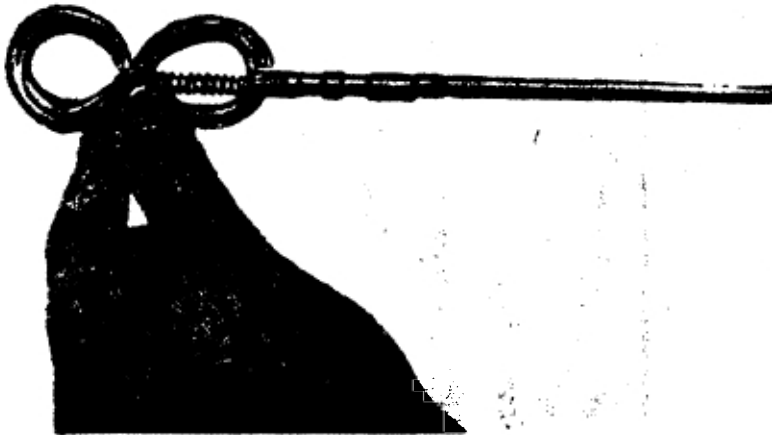


Figure 66. Mounting the Wick on the Cleaning Attachment

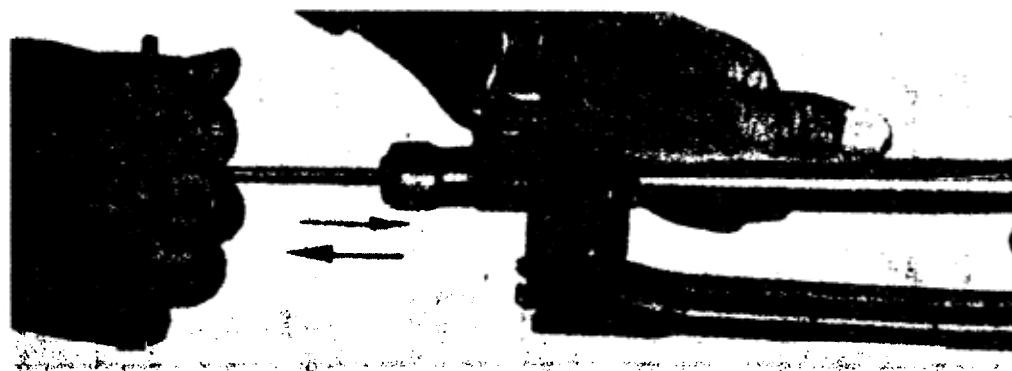


Figure 67. Cleaning the barrel.

#### X. STORAGE OF THE LMG

The LMG must always be ready for action. The machine gunners, the squad leaders and the officers into whose care the weapons were given are responsible for the storage and the condition of the MG's, the spare parts and the accessories. During the billeting of the units in barracks and elsewhere, the MG's of the units have to be stored in an armory. The MG's must be placed vertically in specially-arranged arms stands. The bipod is to be folded and secured by means of the spring lock. The bolt mechanism is to be uncocked and the sight slide is to be placed on front sight 1.

The belts are to be stored in the drums in the lowest compartment of the stand or in cabinets. The accessories must be in the recess of the butt.

During the billeting of a unit in emergency quarters (summer camp, village) the MG's have to be stored in an appropriate dry place (not near doors, stoves or heating apparatuses). They have to be placed on benches, stored on shelves or hung on nails or hooks.

During railroad transports, the MG's have to be placed in stands provided for this purpose or stored on shelves in such a way that they cannot fall out and be damaged.

During short railroad transports or transport on motor vehicles, the MG's must be held by the machine gunners between the knees. The MG's are to be protected against blows, dust effect, dirt, precipitation or action by the sun.

Spare MG's are generally stored at the armory. The equipment of the storage place must be in accordance with the regulations concerning the storage of artillery armament and ammunition.

In exceptional cases, when no equipped storage rooms are available, the weapons can be stored in boxes with special permission.

In the armory, the MG's are to be placed in stands. The drums with the belt are to be stored on racks, the accessories have to be in the butt of the MG, and the spare parts have to be stored in cabinets or on racks.

The stands have to be supplied with ordinal numbers and with a chart showing the unit to which the arms belong and the serial numbers of the arms.

The commanding officer to whom the MG's were delivered is responsible for their condition in the armory.



He is obligated:

- to examine the technical condition of the MG's in the storage place periodically;
- to be exactly informed after inspection about the accuracy of fire of the MG's;
- if necessary, to have the MG's cleaned and inspected after a discussion with the head of the armory.

## XI. AMMUNITION

### 32. General

The LMG fires 7.62 mm short cartridges, Model 1943. In accordance with their operational possibility, the cartridges are of variable construction.

The weight of the bullets and the initial velocity enable the firing with all types of cartridges at the same sighting position.

Both live and drill cartridges are used.

### 33. Live cartridges

Live cartridges are divided into cartridges with ordinary bullets and cartridges with special bullets.

Cartridges with ordinary bullets are used for combat against living targets of the adversary.

Cartridges with special bullets are used according to their construction for target indication, fire correction, for the ignition of fuel and inflammable substances, as well as for combat against lightly-armored targets.

Cartridges with tracer bullets are used for target indication, fire correction and combat against living targets. They are able to ignite easily combustible objects.

The bullet leaves behind in flight a red luminous track that is easily visible by day and night.

The tracer composition burns for a flight distance of 800 m.

Cartridges with incendiary armor bullets are used for the ignition of engine fuels and fuels and for combat against targets behind slightly armored shelters at a distance of up to 300 m.

Cartridges with incendiary bullets are used for the ignition of engine fuel and fuels in metal containers or tank cars with a wall of thickness of up to 3 mm, and for the ignition of easily inflammable objects at a distance of up to 700 m.

The bullet leaves a red luminous track behind that is easily visible by day and night.

The tracer composition burns for a flying range of 700 m.

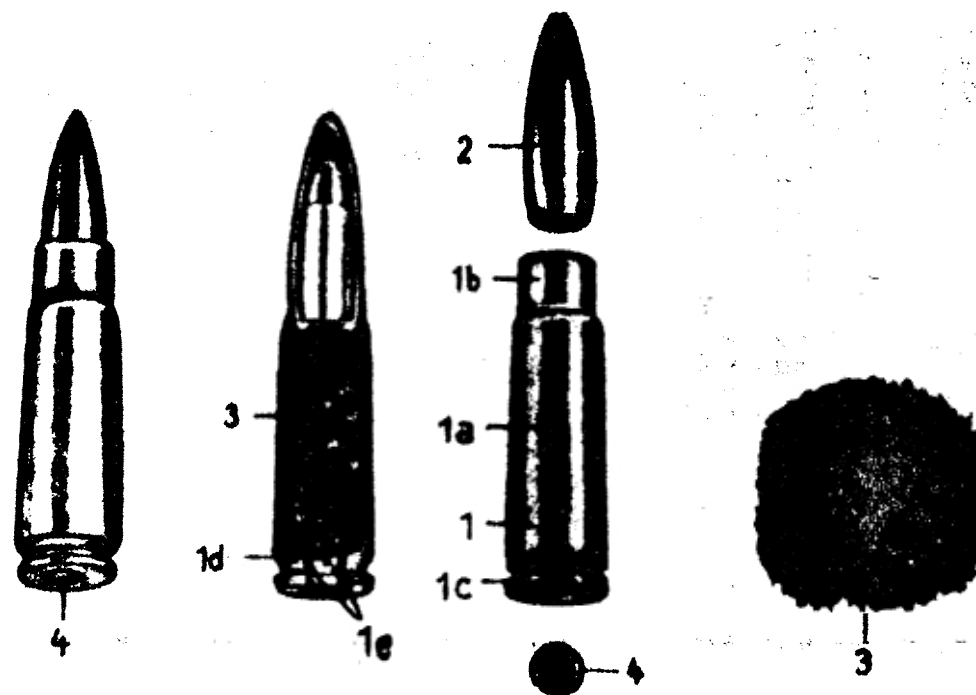
Construction of the live cartridges

The live cartridge (figure 68) consists of cartridge case 1, bullet 2, powder charge 3 and percussion cap 4.

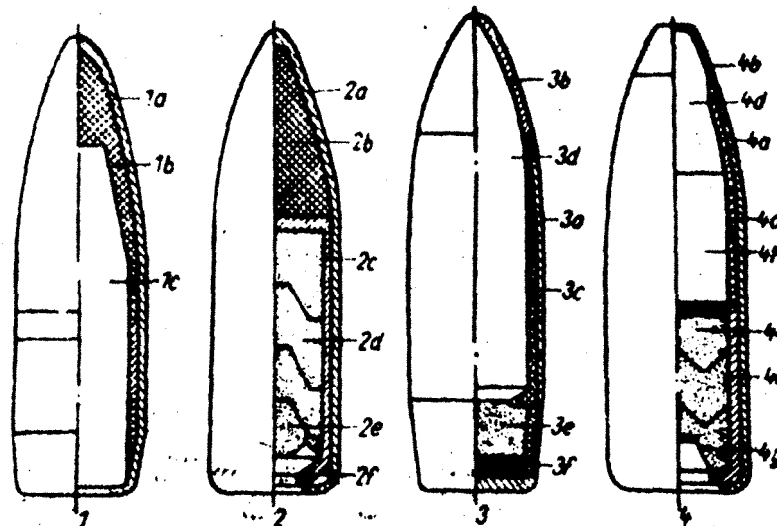
The cartridge case consists of the cartridge case jacket 1 a, in which the powder charge is contained, the neck of the cartridge 1 b, into which the bullet is pressed; the base of the cartridge case 1 c, in which the percussion cap is inserted.

In the base of the cartridge case is the percussion cap and the anvil 1 d, on which the percussion cap is smashed by the point of the firing pin, two detonating canals 1 e, through which the explosive flame of the percussion cap reaches the powder charge and ignites it.

The percussion cap consists of a brass cap with pressed in detonator composition and a foil that is shielding the detonator composition.



**Figure 68.** Live cartridge: 1 - Cartridge case; 1a - cartridge body; 1b - neck of cartridge; 1c - cartridge case base; 1d - anvil; 1e - detonating canals; 2 - bullet; 3 - powder charge; 4 - percussion cap.



**Figure 69.** Bullets: 1 - Ordinary bullet; 1a - jacket; 1b - lead casing; 1c - core; 2 - tracer bullet; 2a - jacket; 2b - lead core; 2c - charge; 2d - tracer composition; 2e - detonator composition; 2f - exhaust; 3 - armor incendiary bullet; 3a - jacket; 3b - nose of bullet; 3c - lead casing; 3d - core; 3e - charge; 3f - detonator composition; 4 - incendiary bullet; 4a - jacket; 4b - nose of bullet; 4c - lead casing; 4d - core; 4e - charge; 4f - tracer composition; 4g - detonator composition; 4h - powder train.

34. Identification characteristics of the bullets.

The nose of the ordinary bullet is uncovered.

Weight: 7.9 g

The nose of the tracer bullet is green.

Weight: 7.5 g

The nose of the armor incendiary bullet is black and has a red ring.

Weight: 7.7 g

The nose of the incendiary bullet is red.

Weight: 6.6 g

35. Mode of operation of the special bullets

Tracer bullet

On discharge, the detonator composition is ignited by the powder gases. After the bullet has left the barrel, the detonator composition ignites the tracer composition, which during the flight forms the tracer bullet trajectory.

Armor Incendiary bullet

The steel core penetrates the armor on the impact of the bullet. The incendiary agent is ignited during the impact of the bullet and ignites adjacent easily inflammable substances.

Incendiary bullet

On discharge, the detonator composition is ignited by the powder gases.

After the bullet has left the barrel, the detonator composition ignites the tracer composition, which during the flight forms the tracer bullet trajectory.

The incendiary agent is ignited during the impact of the bullet and explodes the nose provided with tombac and the jacket of the bullet. The flame resulting from it ignites all easily inflammable substances. If the tracer composition has not yet been completely burnt, it also causes the ignition of all easily inflammable substances.

### 36. Practice cartridges

Practice cartridges include dummy and blank cartridges, 7.62 mm, model 1943.

The dummy cartridge is intended for training. It has a longitudinal recess on the cartridge-case jacket and deep indentations at the neck of the cartridge. The percussion cap is deactivated. There is no powder charge in the cartridge case.

The blank cartridge is provided for fire imitation during tactical exercises. It has no bullet. The neck of the cartridge is radially pressed together.

### 37. Packing of the cartridges

The cartridges are furnished in iron-mounted wooden boxes. In each box are two zinc cases. The box has the following inscriptions:

- Caliber of the cartridge, model of the bullet and metal of the cartridge case;
- number of the cartridges in the box;
- number of the shipment and of the manufacturing firm;
- month and year of manufacture;
- brand of the powder.

If the cartridges are contained in packages (cardboard boxes of 20 each), the inscription "In Packages" is added.

The box cover must also indicate the nomenclatures, the class of the shipment, a danger signal and the total weight of the box.

Numerals are staved in on the bottom of cartridge cases. The upper figure is the number of the manufacturing firm, and the lower one that of the manufacturing year.

The cartridges are packed in galvanized cases of 660 each without packages, or of 460 each in packages.

### 38. Safekeeping and storing of the ammunition

The ammunition must be protected against moisture, dust and humidity. Damp ammunition can rust in a few days and become unusable for firing.







